LABORATORY LESSONS IN RELATED GENERAL SCIENCE AND PHYSIOLOGY FOR VOCATIONAL HOMEMAKING SCHOOLS IN KANSAS

by

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INTRODUCTION

The Smith Hughes Act of 1917, which introduced the present vocational program in homemaking, requires that some time be given daily in the all-day vocational classes to the teaching of related subjects. The term "related" as used here means "related to the home" or "related to homemaking". Any subject, other than home economics, that contributes directly to the training for homemaking is termed a related subject. Art, design, social science, general science, bacteriology, physics, chemistry, and physiology, when taught with the emphasis on their relation to homemaking are related subjects.

In the Kansas all-day vocational program in homemaking the related sciences are given an important place, related general science and related physiology being two of the four related subjects taught. Related general science is offered during one semester of the freshman year and related physiology during one semester of the sophomore year. From forty-five to sixty minutes each day are allowed for related subjects with approximately two or three periods per week set aside for laboratory lessons.

Related general science and related physiology with few exceptions, are taught by the home economics teacher. The

teaching of these subjects has been very difficult for most of the homemaking teachers. There are no related science texts available, no detailed course of study and few teaching guides. Teachers generally have been given little training in the teaching of these related subjects. Too, the constant turnover of teachers in Kansas high schools brings each year to many inexperienced homemaking teachers in the vocational program the responsibility of teaching related general science and related physiology. The laboratory lessons, most important in the teaching of subjects of this nature, have been especially difficult. Often they have been inadequately planned and most ineffectively taught.

The purpose of this study was to organize and arrange detailed laboratory lessons for the related general science and physiology courses in the Kansas all-day vocational program in homemaking in order to provide definite aid to the teachers of these courses and to help improve these courses as now taught.

STATUS OF KNOWLEDGE IN THIS FIELD

Though related science as a subject is one of the most recent additions to the curriculum, the teaching of science has for sometime been well established in all schools. The list of science subjects offered in the secondary schools is wide and varied and practically no high school is without

science instruction of some type. However, the courses most frequently taught are general science and physiology. A number of studies have been made in the teaching of these subjects and general principles for their teaching have been accepted. Because related general science and physiology have their beginning in general science and physiology a brief review should be made of statements of leaders in teaching of science at the secondary level as well as studies in the teaching of related science.

Pieper and Beauchamp (1925) stated that the science course should be organized into units, each unit representing a major topic or problem of everyday significance. With such a plan the students approach and see the facts and principles of science in their proper environmental relations and use only such facts and principles as are necessary to solve the major problems of their surroundings.

Downing (1934) stated, "The success of the teaching process must be measured in terms of the changes produced in the pupils. The real teacher is engaged in directing the activities of the pupils as to develop in them those abilities and skills that will enable them to meet successfully the problematic situations that are bound to arise in their lives. Consumer science is concerned with a few principles that are needed in solving common problems of everyday life. The science of the secondary schools needs to be taught as

a preparation for life."

Hunter and Whitman (1934) suggested that science must aid a pupil of the secondary schools in solving his home science problems.

The Science Committee of the Progressive Education Association (1936) reported a study of the teaching of science in the secondary schools. In this were listed the objectives and understandings, ideas or principles for high school science. The statement was made that the aim of general education is to promote the continuous reconstruction, improvement and enrichment of individuals and social life through the orientation of the individual in the basic relationships of living. It was further said that the student should be aided to undertake the pursuits of those understandings and inquiries in response to problems which he generally feels and that the teacher, if he were to use one of the understandings as the basis for a unit of science instruction should endeavor to present it as a problem.

A review of literature reveals that only a few studies on the teaching of related science have been reported.

The Federal Board for Vocational Education (1924) began a study of the teaching of science related to the home which was continued until it was reported in the bulletin, The Teaching of Science Related to the Home (1931). The study consisted chiefly in determining possible science principles

to be taught, objectives for related science and suggestions for problems and class activities. Although a series of lessons was included for teaching suggestions no attempt was made to organize the material into a specific course.

Threlkeld (1929) made a study of the problem method in the teaching of related science in Iowa high schools. While this study reveals that it offers valuable suggestions of a general nature for the teaching of related science, it does not offer much specific help for planning and teaching of laboratory lessons.

Lee (1929) made a study of the minimum science principles for the required subject matter in vocational home economics schools in Kentucky. This was published (1931) as the bulletin, A Course in Science Related to the Home for Kentucky High Schools. Although class problems and activities were suggested, laboratory lessons were not definitely planned.

Huston (1929) made a study in which a course of study for general science related to home economics was planned. She, too, gave little attention to plans for laboratory lessons.

Most State Departments of Vocational Education have prepared from time to time mimeographed and printed materials to aid in the teaching of related science. However, much of it has been of a general and sug estive nature and

usually for immediate and temporary use.

METHOD OF PROCEDURE

1. The course of study for related science in Kansas Vocational Schools was used as a basis for this study.

2. The course of study including objectives, units, generalizations, and problems was carefully checked by college instructors of household physics, physiology, health education, and education, state supervisors of vocational homemaking and science and home economics teachers in Kansas secondary schools. Revision was then made in keeping with the corrections and suggestions given.

3. The course was checked also with the objectives of Dr. Elliot Downing for high school science and with those of the Progressive Education Association and changes made accordingly.

4. The laboratory lessons were then planned in detail. Current science and home economics texts and bulletins and the personal experience of the investigator were used in doing this.

5. Copies of the detailed laboratory lessons were given by the investigator to vocational homemaking teachers in Kansas at their state conference in August 1936, with instructions for class use. The lessons with criticisms and suggestions by the teachers were returned to the investigator

after use in their classes.

6. The lessons were also checked by college instructors of household physics, food, clothing, health education, physiology and home economics education.

7. The lessons were then carefully rechecked, revised and prepared in a form suitable for class use.

OBJECTIVES FOR RELATED SCIENCE [1]

1. To develop an interest in using science to improve personal, home, and community life.
2. To recognize problems to the solution of which science principles are applicable.
3. To understand the important part science plays in the establishment and maintenance of efficient, safe, sanitary and comfortable homes.
4. To develop a real desire to use science for improving home and community life.
5. To develop the ability to use science in the solving of personal, home, and community problems.
6. To develop a great respect for and ability to see and interpret the phenomena of nature which goes on about us at all times.
7. To develop some appreciation of the achievements of science and the devoted labors of great scientists.
8. To grasp the moral import of the orderliness of nature and of the pupils obligation to adjust himself to her laws.

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[1] From, The teaching of science related to the home. Federal Board for Vocational Education. Bul. 158.

OBJECTIVES FOR RELATED GENERAL SCIENCE

1. To understand the relation of food to nutrition.
2. To care for food in the home.
3. To preserve food properly.
4. To secure a safe, adequate, and convenient supply of water in the home.
5. To make proper disposal of the waste products of the home.
6. To use desirable methods of heating and ventilating the home.
7. To light the homes safely and adequately.
8. To know how electrical and mechanical devices can make the home comfortable and convenient.
9. To care for the home and its furnishings and equipment.
10. To keep the home free from common household pests.
11. To know the physical and chemical properties of common textiles.
12. To care for clothing.

OBJECTIVES FOR RELATED PHYSIOLOGY

1. To understand the importance of good health.
2. To maintain high standards of healthful living.
3. To desire a healthy mind and body.
4. To know how good health can be secured.

5. To acquire good health habits.
6. To know the important functions of the body and their relation to health.
7. To know the importance of regular physical and dental examinations.
8. To realize that good health is an important responsibility of the individual to society.
9. To prevent disease and its spread.
10. To maintain desirable standards of personal home and community hygiene and sanitation.
11. To evaluate advertisements and other statements concerning health and hygiene.

RELATED GENERAL SCIENCE

UNIT I. SELECTING AND CARING FOR OUR FOOD. THREE WEEKS.

Generalizations, Ideas or Understandings to Be Developed.

1. Man's food is obtained from plants, animals and minerals.

2. Food furnishes material for growth, repair, energy and general well being.

3. The essential food elements are carbohydrates, proteins, fats, minerals, vitamins, and water.

4. The food elements can be identified by specific chemical, physical and physiological tests.

5. Food should be so chosen that the body needs are adequately met.

6. Health depends to a great extent upon the selection and care of food.

7. Food to be safe for consumption should be cared for properly at all times in the market, in transportation, in storage, and in preparation.

8. Correct methods of food preparation increase its palatability, digestibility, healthfulness and use to the body.

9. Food preservation is important in reducing food costs, in insuring variety in the diet, and in providing balanced meals throughout the year.

10. Correct and up-to-date methods should be used in food preparation preservation.

11. Though federal, state and local laws and regulations give some food protection, they still are inadequate and more safeguards are needed.

Problems for Discussion Lessons:

1. What are the sources of our food?

2. Why do we need food?

3. What foods should we eat?

4. How much food should we eat?

5. Why do we cook foods?

6. How are foods kept from spoiling?

7. What is the proper care of food?

8. What methods of food preservation are used in the home?

9. What protection are we given for our foods?

Problems for Laboratory Lessons:

1. What are the common tests for proteins, carbohydrates, fats, and minerals?

2. How can we know the amount of food we should eat?

3. How shall we cook our foods?

4. What causes foods to spoil?

5. How shall we care for our food in the home?

Suggestions for Additional Laboratory Lessons:

1. How shall we can fruits?

2. How shall we can vegetables?

3. What use shall we make in our foods of desirable microorganisms?

Science Principles Involved:

Laboratory Problem 2.

1. The union of carbon with oxygen inside or outside the body produces heat and other forms of energy.

Laboratory Problem 3.

1. The amount of a solid dissolved depends upon the kind and temperature of the dissolving substance or solvent.

2. Some solid substances which are not dissolved but are held up by the solution will separate if solution stands or will filter out.

3. Acids and alkalies react on some materials more readily than others producing both desirable and undesirable results.

4. Colors in food and textiles are affected by heat, certain chemicals and sunlight.

Laboratory Problem 4.

1. Microorganisms responsible for decay and disease are found everywhere.

2. For their life processes microorganisms must have proper conditions of food, air, moisture, sunlight and temperature.

3. Microorganisms may be destroyed or their activity

retarded by sufficient heat, cold and certain chemicals.

Laboratory Problem 5.

1. Insect pests will not survive if the conditions of food, air, sunlight, moisture, and temperature are properly guarded. They may be destroyed by use of certain chemical agents.

UNIT II. SECURING A SAFE AND CONVENIENT WATER SUPPLY. THREE WEEKS.

Generalizations, Ideas or Understandings to Be Developed:

1. Water is required in body regulation, cleaning, cooking, waste disposal, heating, ventilating, air conditioning and cooling, storage, and gardening.

2. The water supply should be safe, plentiful, convenient, and inexpensive.

3. Every home and community should feel a responsibility in securing this kind of water supply.

4. Safe water is that which is free from disease producing organisms and other harmful substances.

5. The source of the water supply should be free from contamination and the water should be tested frequently to insure its purity.

6. Precautions should be taken at all times to prevent contamination of the water supply.

7. Procedures that make for safe water should be used as necessary, such as, frequent cleaning of wells and

cisterns, frequent cleaning and changing of filters in cisterns and wells, boiling all questionable drinking water and using chemicals for purification.

8. Soft water is generally more desirable than hard water, but hard water can be softened satisfactorily.

9. Every home should be arranged so that a water supply is as convenient as is possible for the use of its members.

Problems for Discussion Lessons:

1. Why is the home and community water supply important?

2. What are the standards of a good water supply?

3. What are the sources of our water?

4. What is safe water?

5. How is our water supply kept safe?

6. How is a convenient water supply provided in the city home?

7. How can a convenient water supply be provided in the small town and country home?

8. How is water used in cookery?

Problems for Laboratory Lessons:

1. How shall we test the purity of our water?

2. How can we purify water?

3. How can we soften water in our homes?

4. How does the pump furnish water?

5. How shall we repair faucets?

6. How can we have a convenient water supply in our homes?

7. How do we use water in cookery?

Science Principles Involved:

Laboratory Problem 1.

1. Microorganisms responsible for decay and disease are found almost everywhere.

Laboratory Problem 2.

1. Some solid substances which are not dissolved but are held up by the solution will separate if the solution stands or will filter out.

2. The application of heat and the addition of certain chemicals to some substances in solution change those substances into others which are precipitated.

Laboratory Problem 3.

1. The amount of a solid dissolved depends upon the kind and temperature of the dissolving substance or solvent.

2. Some solid substances which are not dissolved but are held up by the solution will separate if the solution stands or will filter out.

3. The application of heat and the addition of certain chemicals to some substances in solution change those substances into others which are precipitated.

UNIT III. HOW TO CARE FOR WASTE PRODUCTS OF THE HOME.
ONE-TWO WEEKS.

Generalizations, Ideas or Understandings to Be Developed:

1. The waste products of the home include body wastes, dirt, garbage, paper, and all other trash.

2. Proper disposal of these must be made if health, comfort, beauty in surroundings, and prevention of fire are to be maintained.

3. Improper disposal of wastes is a means of contaminating our water and food supply and may be responsible directly for many infectious diseases.

4. A safe disposal of all body wastes should be made in every home.

5. Trash piles and other breeding places of microorganisms should be burned or treated with chemicals.

6. Every home should have some means for satisfactory removal of waste, water, and food.

7. Every member of the family should cooperate in proper disposal of the waste products of the home.

8. The community should aid the home in making proper disposal of its waste products.

Problems for Discussion Lessons:

1. Why is proper disposal of home wastes necessary?

2. What is satisfactory disposal of body wastes?

3. What disposal shall be made of garbage and other food wastes?

4. What shall we do with paper, dirt and other trash?

5. How can the community aid the home in disposal of wastes?

Problems for Laboratory Lessons:

1. How shall we plan for the disposal of waste products in our homes and community?

2. How shall we judge the method of waste disposal in our homes?

Science Principles Involved:

1. Microorganisms responsible for decay and disease are found almost everywhere.

2. Microorganisms may be destroyed or their activity retarded by sufficient heat, cold and certain chemicals.

3. Insect pests will not survive if the conditions of food, air, sunlight, moisture, and temperature are properly guarded. They may be destroyed by use of certain chemical agents.

UNIT IV. PROVIDING HEAT AND FRESH AIR IN OUR HOMES. TWO WEEKS.

Generalizations, Ideas, or Understandings to Be Developed:

1. The home should have facilities for proper heat and ventilation.

2. The common ways of heating a home are fireplace, stove, and furnace.

3. The heating system used should be as efficient, convenient and effective as possible.

4. The heating system should be chosen in relation to its cost and to the type of house and its possible efficiency.

5. Heat is transmitted either by radiation, conduction, or convection in any heating system.

6. The best temperature for all-round bodily comfort and efficiency is from 68-70 degrees, providing the humidity and air movement are correct.

7. The temperature of the entire house should be more or less constant varying with the activity carried on in a room and with the age and health of the occupants.

8. Ways of controlling high temperatures in the summer have recently been devised for houses and other buildings.

9. The fireplace is more valuable for attractiveness than efficiency in heating although it is an excellent aid in ventilation.

10. The stove has been so improved that its efficiency in heating and attractiveness has been greatly increased.

11. The furnace is generally a more satisfactory means of heating and ventilating the house than a stove.

12. The furnace in reality is a large stove with a jacket and pipes extending to the various parts of the house.

13. The most common sources of heat are wood, coal, coke, gas, kerosene, crude oil, and electricity.

14. Some means of securing proper ventilation, natural or artificial, in the house should be provided.

15. Windows and other openings should be so located that cross air currents are possible.

16. Proper insulation in the construction of the house aids in maintaining a more constant indoor temperature.

17. Sufficient fresh, clean air of the proper humidity should be possible in the house.

Problems for Discussion Lessons:

1. Why are the heating and ventilating of our homes so important?

2. What are the standards for heat and ventilation in the home?

3. How do we heat our homes?

4. How do the different methods of heating compare?

5. How is the heat produced by a fire regulated?

6. How do we ventilate our homes?

7. How shall we choose the heating and ventilating system for our home?

8. How can the temperature and humidity in the home be controlled?

Problems for Laboratory Lessons:

1. How is heat transferred?

2. How are the different types of stoves operated?

3. How shall we judge our heating system?

4. How shall we ventilate our homes?

5. How shall we control the temperature in our home?

Science Principles Involved:

Laboratory Problem 1.

1. Solid substances become heated by actual contact with other solids that are already heated -- a process of conduction.

2. Some materials conduct heat more rapidly than others. Each material has a definite conducting rate.

3. Gases and liquids become heated by actual movement of heated material, a process of convection.

4. Light, shiny surfaces reflect heat; dull and dark ones absorb and radiate it -- a process of radiation.

Laboratory Problem 2.

1. The union of carbon with oxygen inside or outside the body produces heat and other forms of energy.

2. Every substance has its definite kindling point under given conditions.

3. Proper proportions of oxygen and fuel raised to the kindling temperature result in complete combustion.

Laboratory Problem 5.

1. Factors influencing rate of vaporization are change in temperature, size of surface exposed, humidity of air, kind of liquid vaporizing, and rate of air circulation.

UNIT V. HOW TO HAVE A WELL-LIGHTED HOME. TWO WEEKS.

Generalizations, Ideas or Understandings to Be Developed:

1. Proper and adequate lighting makes the house attractive, comfortable, and healthful.

2. Both the natural and artificial lighting should be considered in planning and furnishing the home.

3. In planning the lighting of the home, the prevailing weather conditions, the geographical location, the amount of quality of sunlight available, the direction the house fronts, and the type of artificial lighting available should all be considered.

4. Adequate window space is necessary in the home, at least one-sixth to one-fourth of the floor space being the recommended amount.

5. The location of the windows should be such that the right kind and amount of light coming from the right direction is possible.

6. The window spaces should be such that artificial lighting, as a rule, is unnecessary during the daytime.

7. The best means of lighting available should be chosen for the home.

8. Any system of lighting should be correctly installed and used.

9. Present lighting facilities if properly operated and

used in a home will be more efficient.

10. The color and material of the ceiling, walls, woodwork, and furnishings should be such that there is a soft agreeable light in the room.

11. Furnishings and equipment should be located and arranged in order to give the best light.

12. Artificial lighting is produced by gas and electricity.

13. In artificial lighting, as in natural, the amount and softness of the light and the direction from which it comes and the location of the light fixtures are important.

14. The types of lighting are direct, indirect and semi-direct, each having its particular place and use.

15. Each room requires the type of lighting, both natural and artificial, that is best suited to the activities carried on in the room.

Problems for Discussion Lessons:

1. What are the standards for a well-lighted home?

2. How do we use sunlight for lighting?

3. How do we produce and use artificial light?

4. How can we increase the efficiency of present lighting facilities in our homes?

5. How do color and texture affect the lighting of the home?

6. How does the arrangement of furnishings and equip-

ment affect home lighting?

Problem for Laboratory Lessons:

1. How shall we plan for proper lighting in our homes?

2. What are the effects of color and texture on lighting?

3. How shall we determine the best place for our lighting fixtures?

4. How shall we plan the lighting for various rooms in our homes?

Suggestions for Additional Problems:

1. How shall we arrange our rooms for good lighting?

Science Principles Involved:

Laboratory Problem 1.

1. Light travels in a straight line until it strikes a new material or medium, then it may be reflected, transmitted or absorbed in part or entirely.

2. Shiny or smooth and light surfaces reflect more light than dull or rough and dark surfaces that absorb and diffuse it.

3. Light passes through transparent and partially transparent materials, some materials absorbing more of light rays than others.

4. Reducing the brightness of light source; that is enlarging its apparent area or diffusing the light, helps relieve glare.

UNIT VI. GETTING THE MOST FROM OUR HOUSEHOLD EQUIPMENT. THREE WEEKS.

Generalizations, Ideas or Understandings to Be Developed:

1. Household equipment consists of mechanical and electrical devices and utensils that aid in the work of the home.

2. Equipment should be selected in relation to the family income, size of house, number in family, and its expected use.

3. Information concerning the efficiency of a piece of equipment should be ascertained before purchasing.

4. Equipment if properly chosen and used provides for efficiency and comfort in the home.

5. After equipment is purchased it should be used in performing household tasks and in the correct manner.

6. Equipment that complicates or makes for added work is undesirable.

7. All equipment should be properly cared for, both in use and storage.

8. Equipment improperly used and cared for is an extravagance and waste.

9. Many simple repairs of equipment can be done at home.

10. Each piece of equipment has its point of maximum

efficiency which should be sought and kept by the operator.

Problems for Discussion Lessons:

1. What shall we consider as household equipment?

2. How does household equipment aid in doing the work of the home?

3. What shall be our standards in selecting equipment for the home?

4. How shall we select and use our kitchen equipment?

5. How shall we select and use our laundry equipment?

6. How shall we select and use our cleaning equipment?

7. What care shall we give to our equipment?

Problems for Laboratory Lessons:

1. How shall we classify equipment used in the home?

2. How shall we test the efficiency of the equipment in our homes?

3. How shall we repair equipment in our homes?

4. How shall we care for equipment in our homes?

Science Principles Involved:

Laboratory Problem 2.

1. When work is done by means of a lever the force exerted times the distance from the force to the fulcrum equals the work done times the distance from the fulcrum to the work. The muscles and bones of the human body act as mechanical levers.

2. It is easier to move an object at a gradual slope

than to move it at a perpendicular angle.

3. The less friction in a machine the greater the efficiency.

Laboratory Problem 4.

1. Corrosion or rusting may be prevented by protecting the substances from oxygen and moisture or other chemical and catalytic agents.

UNIT VII. HOW TO DO CLEANING IN THE HOME. THREE WEEKS.

Generalizations, Ideas or Understandings to Be Developed:

1. The home to be restful, healthful, and satisfying should be clean and well cared for.

2. Proper methods to keep the home clean should be known and used.

3. Cleaning in the home includes the care of rooms, furnishings, fixtures, equipment, and clothing.

4. The methods and cleaning agents used depend upon what is to be cleaned.

5. Certain chemicals have been found to be good cleaning agents, but the manner of use and probable results should be known before using them.

6. Much of household equipment, sometimes called labor saving devices, has to do with cleaning processes in the home.

7. A large part of the time required in caring for the

home is spent in cleaning.

8. Methods and plans that reduce the time required for cleaning and still result in effective work are much to be desired.

Problems for Discussion Lessons:

1. What are the standards for a clean house?

2. How shall we plan the cleaning in our homes?

3. What equipment aids in cleaning?

4. What methods shall we use in cleaning the various rooms?

Problems for Laboratory Lessons:

1. How shall we clean the various rooms in the house?

2. How shall we clean the furniture and large pieces of equipment?

3. How shall we clean the furnishings?

4. How shall we clean household utensils?

5. How shall we clean our silverware and other household metals?

6. How shall we clean the glass in our homes?

7. How shall we clean the china and porcelain in our homes?

8. How shall we rid the home of household pests?

Science Principles Involved:

Laboratory Problem 4:

1. Acids and alkalies react on some materials more

readily than others producing both desirable and undesirable results.

Laboratory Problem 5.

1. The application of heat and the addition of certain chemicals to some substances in solution change those substances into others which are precipitated.

Laboratory Problem 7.

1. Acids and alkalies react on some materials more readily than others producing both desirable and undesirable results.

Laboratory Problem 8.

1. Insect pests will not survive if the conditions of food, air, sunlight, moisture, and temperature are properly guarded. They may be destroyed by use of certain chemical agents.

UNIT VIII. HOW TO SELECT AND CARE FOR OUR CLOTHING.
TWO WEEKS.

Generalizations, Ideas or Understandings to Be Developed:

1. The common textile fibers are cotton, silk, linen, wool, and rayon, each having its specific characteristics and uses.

2. In choosing clothing the properties of the fibers composing the fabrics and the use to be made of the fabrics should be taken into consideration.

3. Generally tests are necessary to determine the exact

fibers of which a fabric is made.

4. Because many of these tests are difficult to do outside of a laboratory, fabrics should bear labels stating the fibers used and their important qualities.

5. One's clothing should always be clean and good methods should be used in maintaining this standard.

6. Correct methods should be known and used in laundering the fabrics.

7. The kind of clothing worn has a direct bearing upon one's health which should be given consideration in selecting clothing.

8. Changes of season require changes in kind of clothing; cotton and linen fabrics are generally cooler than wool and silk.

9. Fast color, regardless of the method used in dyeing is always to be desired.

10. In removing stains successfully the nature of stain and the fiber must be known as well as the proper method.

11. The weight, type, closeness of weave, nature of the fiber, and type of yarn affect the warmth and coolness of a fabric.

Problems for Discussion Lessons:

1. How does clothing affect our health?

2. How does clothing keep us warm or cool?

3. What are the characteristics of the common textile

fibers?

4. How shall we select the fabrics for our clothing?

Problems for Laboratory Lessons:

1. How can we make some common tests for the different fibers?

2. How shall we remove stains from our clothing?

3. How shall we launder our clothing?

4. How shall we store our clothing?

5. How are fabrics dyed?

Science Principles Involved:

Laboratory Problem 1.

1. Acids and alkalies react on some materials more readily than others producing both desirable and undesirable results.

Laboratory Problem 2.

1. The amount of a solid dissolved depends upon the kind and temperature of the dissolving substance or solvent.

2. Acids and alkalies react on some materials more readily than others producing both desirable and undesirable results.

3. Colors in food and textiles are affected by heat, certain chemicals, and sunlight.

Laboratory Problem 3.

1. Colors in food and textiles are affected by heat, certain chemicals, and sunlight.

Laboratory Problem 4.

1. Insect pests will not survive if the conditions of food, air, sunlight, moisture, and temperature are properly guarded. They may be destroyed by use of certain chemical agents.

Laboratory Problem 5.

1. Colors in food and textiles are affected by heat, certain chemicals, and sunlight.

RELATED PHYSIOLOGY

UNIT I. KEEPING OURSELVES IN GOOD HEALTH. ONE-TWO WEEKS.

Generalizations, Ideas or Understandings to Be Developed:

1. Good health which includes mental and physical health is an aid to one's happiness, efficiency, and appearance.

2. The indications of good health are correct weight, a good appetite, a good color, pep and vigor, good muscle tone, and a good disposition.

3. Health habits are a means of securing or preventing good health.

4. Good health habits include:

(a) Regular and adequate meals and drinking water

(b) Sufficient sleep, rest, fresh air, recreation and exercise, and good posture

(c) Proper elimination

(d) Cleanliness of mind and body

(e) Regular dental and physical examinations

(f) Mental and emotional control

(g) Proper and suitable clothing

5. Good health habits should be formed early in life.

6. Wholesome environment and right mental set aid in forming good health habits.

Problems for Discussion Lessons:

1. What is good health?

2. How can we have good health?

3. What health habits should we form?

4. How can we know we are in good health?

5. How can bodily weakness be improved and overcome?

6. What health checks and precautions should be taken?

Problems for Laboratory Lessons:

1. How shall we score our health?

2. How shall we use a health record sheet?

3. How can we form some good health habits?

UNIT II. HOW BODY STRUCTURE AND MOVEMENT ARE RELATED TO HEALTH. THREE WEEKS.

Generalizations, Ideas or Understandings to Be Developed:

1. The body is composed of minute cells which are the smallest unit of life.

2. These cells are of different types and are grouped together to form tissues, organs, and systems.

3. The framework of the body, known as the skeleton, is made up of the bones.

4. The skeleton gives the body form and support, protects organs and aids in body movement.

5. The muscles together with the bones, stimulated and controlled by the nerves act as levers which produce body movement.

6. Proper food, sunshine, exercise, and correct posture

are necessary for good skeletal development.

7. Muscle tone and strength depend upon proper food, rest, exercise and posture.

8. Proper muscle and skeletal development are necessary for good health and body growth.

9. Any deviation from normal muscle and skeletal development should be given serious consideration and the advice of a competent physician sought.

Problems for Discussion Lessons:

1. What is the cell's relation to the body?

2. How does the skeleton serve the body?

3. How is body movement brought about?

4. What are the characteristics of healthy bones and muscles?

5. How are the organs of our bodies supported and protected?

6. How do exercise and posture affect our bones and muscles?

7. What is good posture?

8. How does diet affect the bones and muscles?

9. How do internal secretions affect bodily growth and development?

Problems for Laboratory Lessons:

1. What are the characteristics of the cell?

2. How can we have good posture?

3. What exercises shall we take?

4. What are correct working surfaces?

5. How do muscles aid our bones in their work?

6. How shall we test for composition of bones?

7. How shall we plan diets that will aid in good bone and muscle development?

Science Principles Involved:

Laboratory Problem 1.

1. The cell is the structural and physiological unit in all organisms.

2. Protoplasm is the physical basis of life.

Laboratory Problem 2.

1. The stability of a body depends upon the area of the base and the elevation of the center of gravity and the place of the lines of gravity within the base. Bodies fall when the line of gravity is outside the base.

Laboratory Problem 5.

1. When work is done by means of a lever the force exerted times the distance from the force to the fulcrum equals the work done times the distance from the fulcrum to the work. The muscles and bones of the body act as mechanical levers.

2. The less friction in a machine the greater the efficiency.

UNIT III. HOW FOOD IS USED BY OUR BODY. THREE WEEKS.

Generalizations, Ideas, or Understandings to be Developed:

1. Food furnishes material for the energy, growth, maintenance, repair, regulation, and protection of the body.

2. These materials are known as carbohydrates, proteins, fats, minerals, vitamins, and water.

3. The amount and kind of food needed by an individual varies according to age, sex, activity, size, body build, state of health, season, and climate.

4. The body requires proper balance of the food elements, the necessary amount of each being determined by standards established by nutritionists.

5. Three regular adequate meals daily are quite generally accepted as best for the body.

6. Because the body utilizes its food through the cell, the food must be changed into a soluble and liquid form.

7. This process is known as digestion and is brought about by substances known as enzymes which are found in the digestive juices: carbohydrates are digested in the mouth and intestines; proteins in the stomach and intestines; fats in the intestines.

8. After food is digested it is absorbed by means of diffusion by passing through the intestinal wall into the blood stream or into the lymph stream and then into the

blood stream.

9. The blood receiving its oxygen from the lungs carries it and the food substances to the cells which make use of them for growth, maintenance and repair.

10. The circulatory system which consists of heart, arteries, veins, capillaries, and lymph glands, nodes and ducts, provides the route by which the blood carries this nourishment to the cells.

11. Carbohydrates and fats, and proteins to some extent, when taken into the body in excess of body needs, are stored as fat in the cells and tissues and as glycogen in the liver.

Problems for Discussion Lessons:

1. Why do we need food?

2. How much food does our body need?

3. How are foods digested and absorbed in our bodies?

4. How is the food carried to the cell?

5. How are foods utilized by the cell?

6. How are selection and consumption of foods related to their use in the body?

7. How does the preparation of foods affect their use in the body?

Problems for Laboratory Lessons:

1. What are our food requirements?

2. What changes do enzymes make in our food?

3. What path does our food take in digestion?

4. How is our food absorbed?

5. How is food carried to different parts of the body?

6. How shall we make digestion chart of foods?

7. How shall we score our food habits?

Science Principles Involved:

Laboratory Problem 1.

1. The union of carbon with oxygen inside or outside the body produces heat and other forms of energy.

2. The heat obtained from a given quantity of carbon completely oxidized is constant.

Laboratory Problem 2.

1. When solutions of different densities are separated by a permeable or semi-permeable membrane, the one of less density passes to the one of greater density, tending toward equalization of densities on opposite sides of the membrane.

UNIT IV. HOW OUR BODY CARES FOR ITS WASTES. TWO WEEKS.

Generalizations, Ideas or Understandings to Be Developed:

1. Regular and proper elimination of body waste is essential to good health.

2. By means of capillaries, veins, and respiratory organs, waste from the cells is excreted by the kidneys as urine, by the lungs as carbon dioxide, and by the skin as perspiration.

3. Undigested, unabsorbed, and indigestable food is

eliminated through the intestines as feces.

4. Each organ concerned with elimination must function properly or the body suffers physically, mentally and emotionally.

5. Drinking at least 6 to 8 glasses of water daily, eating some roughage, fat and acid and gas forming foods, taking proper amount and kind of exercise, giving proper care to skin, and establishing regular personal habits are all aids in good elimination of body waste.

6. The use of cathartics, laxatives, and enemas for body elimination should be avoided except under the physician's orders.

7. Faulty elimination, if not corrected, may result in serious illness such as hemmorroids, auto intoxication, ulcers, infections.

8. Proper elimination is largely a matter of good health habits and sane wholesome living.

Problems for Discussion Lessons:

1. How does the body eliminate its waste products?

2. Why is proper bodily elimination necessary?

3. Why is bodily cleanliness important in elimination?

4. What are harmful ways to stimulate bodily elimination?

5. What results from poor elimination?

Problems for Laboratory Lessons:

1. How do the organs of excretion function in our bodies?

2. How shall we care for the skin?

3. How shall we plan an anti-constipation diet?

4. What exercises shall we take for constipation?

Science Principles Involved:

Laboratory Problem 1.

1. In the process of oxidation in the organism certain waste products are formed which, if retained, induce fatigue. To facilitate their removal and allow for recuperation, sleep and good ventilation are essential, as is also exercise, to stimulate deep breathing both for increased oxidation and for elimination.

UNIT V. HOW THE GLANDS AND NERVOUS SYSTEM SERVE THE BODY. TWO-THREE WEEKS.

Generalizations, Ideas or Understandings to Be Developed:

1. The body and its processes are regulated and controlled chiefly by the nervous system and endocrine glands.

2. The nervous system has two parts, the central and the autonomic nervous systems.

3. The central nervous system consists of the brain, spinal cord and nerves which direct the voluntary muscles, the conscious state and the reflex and conditioned reflex-actions.

4. The autonomic nervous system, consisting of ganglia, nerve cells and nerve fibers, is closely connected with the central nervous system, and furnishes stimulation to the involuntary muscles and influences emotional reactions.

5. The sense organs, a part of the central nervous system, are the body's only means of connection with the outside world and should be given proper care at all times.

6. The periods of childhood and youth are the best time to train the nervous system.

7. The endocrine glands consist of the pituitary body and the thyroid, parathyroid, thymus, adrenal, pineal, and sex glands.

8. The endocrine glands, often called the balance wheels of the body, influence bodily growth, build, and activity, mental ability and some of the emotions.

9. Overwork, over stimulation and overstrain are extremely injurious to the nervous system and to a certain extent, to the glands.

10. Good health habits and well regulated living are aids to normal functioning of the nervous system and endocrine glands.

11. Any abnormal conditions of the nervous system and these glands should be reported at once to a reliable and competent physician.

Problems for Discussion Lessons:

1. Why does our body need control and regulation?

2. How does the nervous system serve the body?

3. What part does the brain play in the nervous system?

4. What is the function of the spinal cord?

5. How do the nerves carry messages to and from the brain?

6. How are the emotions related to the nervous system?

7. What part do the endocrine glands play in the body?

8. How do the senses serve the body?

9. What are the indications of a poorly functioning nervous system?

10. What is the relation of a healthy body to the nervous system?

11. What care shall we give our nervous system?

Problems for Laboratory Lessons:

1. What are the characteristics of the brain?

2. How can we test the senses?

3. What are the characteristics of the endocrine glands?

4. How shall we plan for the care of our nervous system?

Science Principles Involved:

Laboratory Problem 3.

1. Vital metabolic processes within the body are stimulated or retarded by the degree of activity of certain hormones secreted by various glands; furthermore, most of them depend on the catalytic action of enzymes.

Laboratory Problem 4.

1. Stimulants and narcotics cause excessive irritability of the nerve cells that regulate vital processes and hence are likely to derange such processes in ways unfavorable to the survival of the organism.

UNIT VI. PROTECTING OURSELVES AND OTHERS FROM DISEASE AND INJURY. TWO-THREE WEEKS.

Generalizations, Ideas or Understandings to Be Developed:

1. Disease affects the proper functioning of the body making one less efficient and happy.

2. Diseases are of two types: infectious and non-infectious.

3. Infectious diseases are those caused by microorganisms and are transferred by direct or indirect carriers.

4. Immunity against disease may be natural, borrowed, or acquired.

5. Inoculation and vaccination provide immunity for certain of the infectious diseases, including typhoid, smallpox, diphtheria, tetanus, rabies.

6. Isolation, quarantine and disinfection are preventative measures against the spread of infectious diseases.

7. Early recognition of symptoms and diagnosis of the disease are important in prevention of its spread and also in its seriousness.

8. Non-infectious diseases have various causes some of

which are related to nutrition, health habits and living conditions.

9. Good health habits, sanitary environment, fresh air, sunshine, pure water, good and adequate food, regular dental and physical examinations, prompt and proper medical attention, are all important in resistance and protection against disease.

10. Superstitions, health fads and cure-all patent medicines should be avoided in the treatment of disease.

11. Wholesome and sane living are important in the prevention of disease and injury.

12. Disease and injury many times are the result of carelessness on the part of ourselves or others.

13. Research in the prevention and control of disease is continually going on to add to our store of information, and one should seek to keep up to date on this.

Problems for Discussion Lessons:

1. Why do we become ill?

2. How do microorganisms make us ill?

3. How are disease germs spread?

4. How is the body protected from disease?

5. How can the spread of disease be prevented?

6. What precautions can we take to avoid and prevent accidents?

Problems for Laboratory Lessons:

1. How shall we make a chart of common diseases?

2. What are the characteristics of disease producting microorganisms?

3. How can we protect ourselves from disease?

4. How can we prevent injury to ourselves and others?

Science Principles Involved:

Laboratory Problem 2.

1. Microorganisms responsible for decay and disease are found almost everywhere.

2. Microorganisms may be spread by direct and indirect contact. A living organism when attacked by bacteria sets up a defense which may be strengthened to bring about immunity.

UNIT VII. OUR PART IN THE COMMUNITY HEALTH PROGRAM. ONE-TWO WEEKS.

Generalizations, Ideas, or Understandings to Be Developed:

1. Good health is an important community asset and responsibility as well as a personal one.

2. High standards for community health are necessary for protection of the individual and the family.

3. Each individual has a responsibility to secure, obey, and help enforce adequate quarantine laws, health regulations and food laws of the community, state, and nation.

4. Every individual should do his part to keep his community as well as his home sanitary, clean and attractive.

5. Illness and poor health are expensive in many ways to both the family and community.

6. Adequate laws should be passed to protect the health of the worker in industry and other occupations.

7. Numerous organizations such as Red Cross, Public Health Association, Parent-Teacher's Congress, Women's Federated Clubs, Boy and Girl Scouts, are interested in health and have definite provisions for health work in their programs of work.

8. Schools are interested in health and all are pledged to health as their first objective.

Problems for Discussion Lessons:

1. Why are we interested in community health?

2. What affects the health of the community?

3. What standards of sanitation shall the community maintain?

4. What can the community do to prevent disease?

5. What is our responsibility toward maintaining community health?

6. What organizations have health programs?

Problems for Laboratory Lessons:

1. What are the quarantine laws of our state and city?

2. How shall we judge the community's health?

3. How shall we determine the cost of ill health?

Science Principles Involved:

Laboratory Problem 1.

1. Microorganisms are the immediate cause of most diseases. Their transfer from infected to non-infected individuals is prevented by (a) destroying them, (b) preventing the infection of carriers, (c) disinfection or destruction of carriers, (d) retarding the multiplication of infecting organisms through conditions inimical to their life, (e) establishment of immunity in individuals subject to infection.

UNIT VIII. HOW THE REPRODUCTIVE SYSTEM IS RELATED TO OUR HEALTH. ONE WEEK.

Generalizations, Ideas or Understandings to Be Developed:

1. The reproductive system is the means by which life is continued and has a direct bearing upon the individual's health.

2. The reproductive system controls to some extent the growth and development of the body.

3. Menstruation is an important evidence or proper development of the reproductive system in girls and women.

4. Menstruation is a natural periodic occurrance and requires only slight change of the daily activity and manner of living.

5. Body cleanliness is essential at this time.

6. Upon the appearance of any abnormal conditions of the reproductive system a physician should be called.

7. Self dosage or unauthorized prescriptions and patent medicines may cause serious results and should be avoided.

8. Venereal diseases are extremely harmful diseases transmitted chiefly by means of the reproductive system.

9. Once established in a "family tree," venereal diseases have a far reaching affect.

10. Prevention of venereal diseases is a responsibility of home and community.

11. High ideals and moral standards between boys and girls are necessary in maintaining desirable attitudes toward the reproductive system and its health.

12. The reproductive system is a normal functioning part of the body and its misuse is dangerous to the individual's health and well being.

Problems for Discussion Lessons:

1. How do plants and animals reproduce themselves?

2. What care should be taken to insure healthy reproductive organs?

3. What is the relation of menstruation to reproduction?

4. What care should we give ourselves at the menstrual period?

5. What are the affects of venereal diseases?

Problems for Laboratory Lessons:

1. How shall we care for ourselves at the menstrual period?

2. What are the characteristics of a developing embryo?

Science Principles Involved:

Laboratory Problem 1.

1. Sex is a manifestation of certain metabolic processes, the intensity of which determines the degree of sexuality.

Laboratory Problem 2.

1. All life comes from life and produces its own kind of living organism.

2. The development and maintenance of a healthy organism is dependent upon the environment, provided there are no hereditary factors to prevent this.

UNIT IX. EVALUATING HEALTH INFORMATION. ONE WEEK.

Generalizations, Ideas or Understandings to Be Developed:

1. Careful evaluation of health information should be made.

2. The widespread interest in health is used by many commercial groups to stimulate sale of their products or further "pet" schemes and fads.

3. The present Food and Drug Act protects only in a limited way from fraudulent claims and statements.

4. Claims and statements made over the radio are con-

trolled in no way.

5. The consumer should evaluate all statements made regarding health and products related to health, checking the reliability of their source, the accuracy of the statement and the reasons for being made.

6. The consumer should demand adequate protection from fraudulent use of information concerning health and products related to health.

Problems for Discussion Lessons:

1. What protection do we have from our present food and drug act?

2. How do various groups make use of the general interest in health?

3. What is our responsibility toward health information?

4. How shall we proceed to learn the reliability of a drug or food product?

Problems for Laboratory Lessons:

1. What protection should we have from a food and drug act?

2. How shall we evaluate advertisements pertaining to health?

THE LESSONS

The courses of which these lessons are a part follow the unit, problem plan of organization. Both courses include objectives, units, generalizations, lessons, and the science principles involved in the laboratory lessons.

The laboratory lessons as planned are closely related to the discussion lessons and to problems growing out of home situations. Attempt has been made to make applications of the science principles involved in each lesson. Each lesson is stated in the form of a problem sufficient for one day's accomplishment in order to challenge and stimulate thinking on the part of the pupil. The lessons are planned so that some may be presented as demonstrations by the teacher or pupils, others may be carried out by groups of pupils and still others may be done by the individual pupil. The teacher should use whichever method seems most desirable to her. Regardless of the method used in the conducting laboratory lessons each girl should have a copy of these lessons and should answer the questions in the exercises.

The equipment and materials for the laboratory are simple and can be obtained easily by any teacher. At the beginning of each problem a list of equipment and materials needed for one person is given. Besides this equipment,

reference books of science, foods and clothing will be needed for working the exercises.

The units and problems are arranged in a sequence that seems advisable to the investigator but here again the teacher should study the lessons and arrange them in the order which is most suitable to her.

EQUIPMENT AND MATERIALS FOR RELATED SCIENCE

The following is a composite list of equipment and materials needed for the related science laboratory. It will be necessary to check each problem for the equipment and materials needed for that lesson.

Chemicals (small bottles of:)

Alcohol
Alum
Ammonia
Ammonium hydroxide
Fehling's solution
French chalk
Gasoline
Iodine
Kerosene
Lemon oil
Linseed oil
Lye
Nitric acid
Pancreatin
Pepsin
Rennet
Sodium carbonate
Turpentine

General Equipment

Asbestos mats (12)
Candy thermometers (12)
Corks (different sizes) (12)
Filter paper (1 pkg.)
Glass rod (2 ft.)
Hand lens (12)
Medicine droppers (6)
Microscope
Mirror
Piece of glass (12"x 8"x 8")
Test tubes (24)
Thermometers (6)
Watch with second hand
Wire lamp shade frame
Wooden box (12"x 8"x 8")

Apparatus

Distilling
Filtering
Model of lift pump

Miscellaneous Materials

Chart for astigmatism
Charts on plumbing
Copies of food and drug act
Copies of quarantine laws
Adequate reference books in general science, physiology, foods, and textiles.

LABORATORY LESSONS FOR RELATED GENERAL SCIENCE

UNIT I. SELECTING AND CARING FOR OUR FOOD.

Problem 1. What are the common tests for proteins, carbohydrates, fats and minerals?

Equipment and materials:

Samples of foods

Egg Whites (1)	Beans (4 or 5)
Bread (½ slice)	Oatmeal (1 T)
Butter (1 T)	Crackers (1)
Meat (piece 2"x 2")	Raisins (3 or 4)
Flour (1 T)	Apple (quarter)
Cheese (piece 1"x 1")	Lard (1 T)
Cornstarch (1 T)	Carrots (1 slice)
Sugar (1 T)	Peanuts (2 or 3)
Potato (1 slice)	Cabbage (small piece)

Test tubes (3)

Chemicals

- Nitric acid (40 c.c.)
- Ammonium hydroxide (80 c.c.)
- Iodine (8 drops)
- Fehling's solution (8 c.c.)

Squares of brown paper (1)

Square of asbestos sheeting (1)

Exercise 1. To test foods for protein.

Directions: Place a small amount of foods to be tested in a test tube and add a little water. Add 5 c.c. of nitric acid and heat gradually to boiling. Watch results. Allow the solution to cool, pour off the acid, and add 10 c.c. of ammonium hydroxide.

1. What color was produced when nitric acid was added to:

egg white	_____	flour	_____
bread	_____	cheese	_____
butter	_____	cornstarch	_____
meat	_____	sugar	_____

2. What color was produced when ammonium hydroxide was added to:

egg white	_____	flour	_____
bread	_____	cheese	_____
butter	_____	cornstarch	_____
meat	_____	sugar	_____

3. Which of the foods tested showed a presence of protein?

4. Why are proteins needed in our diet?

5. What foods supply us with protein?

Exercise 2. To test for starch.

Foods to test: potato, beans, oatmeal, crackers, bread, butter, egg white, cornstarch.

Directions: Cut a thin slice of potato and place in water. The other foods to be tested moisten with water. Place each sample separately on plate. Add a drop of iodine. Note color.

1. What color was the following:

potato	_____	bread	_____
beans	_____	butter	_____
oatmeal	_____	egg white	_____
crackers	_____	cornstarch	_____

2. Which of these foods contain starch?

3. Why do we need starch in our diet?

4. What foods supply us with starch?

Exercise 3. To test for sugar.

Foods to test: raisins, sugar, bread, apple, crackers, lard, carrots, egg white.

Directions: Place small amount of each food in test tube. Add a small amount of water and bring to a boil. Pour off liquid. Add about 1 c.c. of Fehling's solution to liquid and boil.

1. What color was the following:

raisins	_____	crackers	_____
sugar	_____	lard	_____
bread	_____	carrots	_____
apple	_____	egg white	_____

2. Which of these foods contain sugar?

3. Why does the body need sugar?

4. What foods do we rely on for our sugar?

Exercise 4. How shall we test for fats?

Foods to test: butter, lard, cheese, egg white, fat meat, peanuts, cornstarch, apple.

Directions: Place a small amount of the foods on squares of brown paper. Put on a warm radiator or in pan over a flame for a few minutes. Remove the samples.

1. What happened to the paper on which the following were placed?

butter	_____	fat meat	_____
lard	_____	peanuts (chopped)	_____
cheese	_____	cornstarch	_____
egg white	_____	apple	_____

2. Which of the foods contained fat?

3. Why do we need fat in our diet?

4. What foods do we rely on for our fat?

Exercise 5. To test for minerals.

Foods to test: bread, water, cornstarch, cabbage, carrots, salt, peanuts, potatoes.

Directions: Grind up foods fine. Burn each on a sheet of asbestos sheeting. Water boil in a dish until evaporated.

1. Which foods completely burned?

2. What was the material that was left on sides of dish after evaporating the water?

3. Find out from food charts what foods contain minerals?

4. What are the minerals essential in our diet?

5. From what foods do we obtain each of the minerals?

Results: Make a chart of the tests for common foods.

Food Chart

Name of food	Protein	Starch	Sugar	Fat	Mineral

Problem 2. How can we know the amount of food we should eat?

Exercise 1. To determine the amount of food to eat.

1. Upon what does the amount of food you eat depend?

2. What is a calorie?

3. How can you "count your calories"?

4. How many calories do you need daily?

5. How many calories does your mother need daily?

6. How many calories does your father need daily?

7. Compare the amount of calories your father needs with the amount each member of the class found necessary for her father. What makes the difference?

Exercise 2. To plan the amount of food we need.

Measure and display some 100-calorie portions of food.

1. What is a 100-calorie portion of the following:

bread	_____	milk	_____
butter	_____	orange	_____
cocoa	_____	potatoes	_____
cracker	_____	raisins	_____
egg	_____	sugar	_____

Take the number of calories you found necessary for you. Plan a diet for two days that would include the right number of calories. Use tables of calories in back of your foods book.

Breakfast		Lunch or Supper		Dinner	
Food	Calories	Food	Calories	Food	Calories
1.					
2.					

3. What else do we need to watch in our diet besides the number of calories?

Problem 3. How shall we cook our foods?

Equipment and Materials:

Samples of food
- Meat (3 small squares)
- Egg white (1)
- Green cabbage (small piece)
- Red cabbage (small piece)
- Spinach (few leaves)
- Green beans (5 or 6)
- Beets (2)
- Soda (¼ t)
- Sugar (1 C)
- Vinegar (1 t)

Sauce pans (2)
Thermometer (1)
Candy thermometer (1)

Exercise 1. To test the effect of cooking meat in different ways in water.

Directions: In a pan put 1 c of cold water. Add a small piece of meat. Allow to stand. In a second pan put 1 c of water, add a small piece of meat and boil 5 min. In a third pan put 1 c of water and bring to a boil, add a small piece of meat and boil 5 min. Observe the three pieces of meat and water on each.

1. What effect did each method have on the meat?

	Juice of meat	Fiber of meat
Pan 1		
Pan 2		
Pan 3		

2. Which method would be best for soup making?

3. How should meat be washed? Why?

Exercise 2. To test the effect of the temperature of water in cooking an egg.

Directions: In a sauce pan place 1 c of cold water. To it is add the white of an egg. Heat. Use a thermometer to find the temperatures.

1. What is the temperature of the water when the egg white begins to change? _____

2. What is the temperature of the water when the egg white is a mass of jelly-like substance?

3. What happens to the egg white when the water boils?

4. How would you poach an egg?

Exercise 3. To know the best methods of cooking vegetables.

Directions:

a. Wash and chop some cabbage. Drop a part of the cabbage in boiling salted water. Cook for 5 or 7 min. Drain, season with butter. In another pan drop a part of the cabbage in boiling salted water and cook for 45 min. Drain, season with butter.

Note: If available different groups use cauliflower Brussel sprouts, turnips.

Compare the two pans of cabbage in regard to color and flavor.

5-7 minutes _____ _____
45 minutes _____ _____

b. Wash and chop some cabbage. Put a part of the cabbage in a pan and cover with plenty of boiling salted water. Cook for 8-10 minutes without a lid on the pan. In a second pan put in a part of the cabbage and cover with boiling salted water. Cover the pan with a lid and cook for 8-10 minutes. Which method had less odor?

1. What rule would you make for cooking green or leafy vegetables?

c. Wash and chop some red cabbage. Drop a part of the cabbage in boiling salted water. Cook for 5-7 minutes. Drain, season with butter. In another pan drop a part of the cabbage in boiling salted water and add a little vinegar.

1. Which was the best way to cook green cabbage? Why?

2. What effect did the vinegar have on the red cabbage?

d. Add a little soda to some cooked spinach and green beans. Continue cooking for a few minutes.

1. What was the result?

2. What would be the danger of adding soda to vegetables?

e. Wash a beet, cover with water and cook until tender. Cool and peel. Peel a beet before cooking. Cover with water and cook in an uncovered pan until tender. Peel a beet before cooking. Cover with water. Cook with a lid on the pan.

1. What was the result?

2. Make a rule for the cooking of beets.

What rules would you make for cooking vegetables?

Exercise 4. To know the stages of sugar cookery.

Materials: Sugar, water, candy thermometer.

Directions: Mix 1 c sugar and 1/3 c water. Put on stove and boil. Stir only as needed to prevent sticking.

1. At what temperature did each of the following occur:

soft ball	_____ °	crack	_____ °
firm ball	_____ °	hard crack	_____ °
hard ball	_____ °	carbon	_____ °

2. Compare your findings with the chart for temperatures in candy making in Harris & Laccy "Everyday Foods", page 326.

soft ball_____	crack _____
firm ball_____	hard crack_____
hard ball_____	carbon _____

3. If a thermometer is not available, drop sugar mixture into cold water to test for various stages. Observe results.

Stage	Appearance
soft ball	
firm ball	
hard ball	
crack	
hard crack	
carbon	

4. Why is the thermometer better than other household tests in candy making?

5. Where else besides the making of candy do we make use of the recognition of the stages of sugar cookery?

Problem 4. What causes foods to spoil?

Equipment and Materials:
Samples of food
Stale bread (1 slice)
Potato (1)
Molasses (1 T)
Small jars (5)
Saucers (2)

Exercise 1. To find what things cause food to spoil.

Directions:

a. In each of three small jars put a piece of moistened stale bread. In a fourth jar put a piece of dry stale bread. Leave lids off of the jars for one or two hours. Cover all jars and partly seal. Put the jars in the following places:

Jar 1: moistened bread in warm water; boil ten minutes. Set aside in warm place.
Jar 2: moistened bread in a warm place.
Jar 3: moistened bread in the refrigerator.
Jar 4: dry bread in a warm place.

Notice each day and keep a record.

Jar	1st day	2nd day	3rd day	4th day
1				
2				
3				
4				

1. What were the conditions that caused the mold to grow on the bread?

b. Wash a potato and boil until about half done. Sterilize a knife by boiling. Cut the potato in two and put each half on a saucer. Cover one immediately and put in a cool place to keep as a control sample. The other half of the potato expose to a room that is being swept. Cover

with a glass and leave in a warm place for 2 to 5 days. Compare the two saucers of potatoes.

1. What happened to the potato?

2. What did this show?

e. Put a little molasses in a small bottle or jar. Add a little warm water. Set aside in a warm place uncovered.

1. What happened to the molasses?

2. What did this show?

After observing these phenomena what do you say causes foods to spoil?

1.

2.

3.

Problem 5. How shall we care for our food in the home?

Equipment and Materials:
Ice box
Thermometer (1)

Exercise 1. To study the effect of cold on the keeping qualities of foods.

Directions: Test the temperatures in the different compartments of the ice box. Record the temperatures.

1. Where was the coldest spot?

2. How does the air circulate in the refrigerator?

3. If you have an ice refrigerator, why wouldn't you cover the ice with paper?

4. What foods would you place in the different compartments?

5. What other methods could you use in the home other than refrigeration to keep foods from spoiling?

a.
b.
c.
d.

Exercise 2. To store our food.

1. What points do we need to consider before we store foods?

Plan for the storage of the following:

1. Potatoes

2. Carrots

3. Flour

4. Sugar

5. Canned fruits and vegetables
6. Jams and jellies
7. Cured meat
8. Dried fruits
9. Dried vegetables
10. Spices

UNIT II. SECURING A SAFE AND CONVENIENT WATER SUPPLY.

Problem 1. How shall we test the purity of our water?

Equipment and Materials:
- Samples of water (8 drops)
  - Stream
  - Cistern
  - Well
  - Tap
- Agar-agar (see directions for making on next page)
- Dishes and covers (8)
- Medicine dropper (1)

Exercise 1. To test samples of water for purity.

Samples of water from: stream, cistern, well, tap.

Directions: On shallow dishes or lids which have been filled with sterilized agar, or a satisfactory culture can be made with beef extract dissolved in gelatine, drop with a sterilized medicine dropper 4 drops of boiled and unboiled water of each of the samples. Cover dishes and set aside in a warm place. Examine from day to day for one week.

1. Record observations of the samples.

	Boiled	Unboiled
Stream		
Cistern		
Well		
Tap		

2. Why does the health officer sometimes order water to be boiled before drinking?

AGAR

Measure 1000 c.c. water
10 g. salt
10 g. peptone
10 g. beef extract
10 g. agar-agar

Dissolve the beef extract in the water. Add agar. Cut into small pieces, salt, and peptone. Heat until the agar dissolves. Add cooking soda until the solution is alkaline, as tested by litmus paper.

Have ready flask and a glass funnel tube which have been sterilized by boiling in water. Place absorbent cotton in the funnel, and filter the liquid while hot. Plug the mouth of the flask with absorbent cotton.

Sterilize for half hour. The best way is to use a steam sterilizer, but fair results may be obtained by setting flask in pail or double boiler partly filled with water, boiling it, tightly covered.

Pour hot solution into dishes which have been sterilized. Allow them to cool, keeping the agar covered in a place free from dust.

Problem 2. How can we purify water?

Equipment and Materials:

Distilling apparatus or
Apparatus to be made in class
- Round pans (2)
- Tube cake pan (1)
- Tin shears

Settling apparatus
- Small bottles (2)
- Alum (few pieces)

For filtration apparatus to be made in class
- Lamp chimney (1)
- Cloth (8"x 8")
- Drinking glass (1)
- Sand (1 C)

Exercise 1. To purify water.

A. Distillation.

Directions: If a regular distilling apparatus is not available, make one. Use two round pans and a tube cake pan. With tin shears slit the sides of the cone and turn down so that the three pans fit together tightly. Fill the bottom pan about half full of water which has been colored with vegetable coloring. Fit the tube pan over it and then fit the other pan over it and fill with cold water. Place on a stove. Boil for 15 minutes.

1. What was in each pan?

Top:

Middle:

Bottom:

2. How is water purified by this method?

B. Filtration.

Directions: Tie a cloth over the bottom of a lamp chimney. Place on the top of a drinking glass. Put in about two inches of coarse sand and fill to about an inch from the top with fine sand. Pour muddy water through this.

1. What was the change of the water in the glass?

C. Settling.

Directions: Fill two small bottles with muddy water. Put a little alum in one bottle. Allow bottles to stand. Observe after 24 hours.

1. What changes do you see in the appearance of the water?

2. Which bottle was the clearer?

What methods do cities use for purifying water?

Problem 3. How can we soften water?

Equipment and Materials:
Samples of water
Cistern or rain water (1 small bottle)
Well water (1 small bottle)
Tap water (1 small bottle)
Ivory soap flakes (1 C)
Test tubes (4)
Medicine dropper (1)

Exercise 1. To test for soft water.

Directions:

a. Make a soapy water solution by putting ivory soap flakes in a bottle of cistern or rain water. Add the flakes until no more flakes dissolve after the bottle is well shaken. Fill three test tubes about one half full with each of the three samples of water. With a medicine dropper add soapy water solution, shaking after each drop.

1. Which of the samples were soft?

b. Take samples of water that proved to be hard and boil a few minutes. Repeat the experiment using the soapy water solution.

1. What was the result?

c. Dissolve some washing soda or borax in the hard water. Try your soapy water solution.

1. What was the result?

What do we mean by:

1. Temporary hard water?

2. Permanent hard water?

How can you have soft water at home?

Problem 4. How does the pump furnish water?

Equipment and Materials:
Model of lift pump from science department or
For making a lift pump in class
Lamp chimney (1)
Corks (one-hole to fit lamp chimney. Two-hole cork smaller)
Strip of oilcloth (6" long x 2" wide)
Wooden stick (16" long)
Pins (6)
Thumb tacks (2)
Glass rod (1)

Exercise 1. To study the rise of water in a pump.

From a model or from a diagram of a lift pump, study the operation of the valves and piston.

Note: The physics department may have a model of the lift pump that you could borrow for this lesson or you might make a model. If no model is available, you may find diagrams in general science books.

Directions for constructing a lift pump: Take a lamp chimney with straight sides. Fit a one-hole cork in the lower end. Cut a strip of oilcloth wider than the hole, place it over the hole and fasten one end with a thumb tack. This will make the lower valve or valve 1. To make the piston take a cork which is slightly smaller than the inside of the lamp chimney. Make two holes in cork and wrap cork with thread until it fits snuggly in the chimney. In one hole force a wooden stick about 16 inches long and fasten to the cork by means of oilcloth as in the lower cork. This makes valve 2. In the upper end of the lamp chimney fit with a two-hole cork. Put the stick through one. Bend a glass rod into a right angle and place in the other hole.

How does the pump furnish us with water?

Pour a little water into the lamp chimney by partly removing the upper cork. Move the piston up and down.

1. When the piston is pushed down, what happens to:

Valve 1:
Valve 2:

2. When the piston is raised what happens to:

Valve 1:
Valve 2:

3. Why is it necessary to move the piston up and down several times before the water comes out the spout?

4. How does the water get out of the pump?

Problem 5. How shall we repair faucets?

Exercise. To repair faucets.

Secure some faucets from the janitor or borrow from the plumber. Examine.

1. What parts may become worn?

Directions for putting a washer in a leaky faucet.

1. Turn stopcock off below the fixture or at the water meter.

2. Unscrew big nut at the faucet with a monkey wrench.

3. Turn valve stem same direction used to turn water on, until valve stem comes out.

4. Unscrew screw that holds rubber, fiber, or leather washer and replace with new washer or turn old washer upside down.

5. Replace the valve stem and tighten screw.

6. Turn on the water supply.

Why are we concerned with a leaky faucet?

Problem C. How can we have a convenient water supply?

Equipment and Materials:
Secure plumbing charts for class to study.

Exercise 1. To have a convenient water supply in a rural home.

1. How is water furnished in your home?

2. Estimate the distance walked in a day in carrying water to the house.

3. Plan how you can have a more convenient water supply than you now have.

4. How could hot water be furnished in your home?

Exercise 2. To know how water is supplied in the town and city home.

Directions: Study plumbing charts.

1. What kind of faucets do you have in your home?

2. How is hot water furnished in your home?

3. What are the advantages and disadvantages of each method of heating water?

4. If you were building a new house, what would you note about the plumbing system?

Problem 7. How do we use water in cookery?

Equipment and Materials
Potato (1)
Pan (1)

Exercise 1. To see the effect of water on a potato.

Directions: Slice a small potato and let stand in water. Examine.

1. What did you find in the water in which you had the sliced potato?

2. Why would you suggest cooking vegetables in boiling water?

Observe this table:

Vetetable	Quality	Measure of Water	Size of Pan	Time to Cook
1. Cabbage	1 medium head	8 c	4 quart	6-8 min.
2. Carrots	10 small	3 c	2-3 quart	20-30 min.
3. Cauliflower	1 medium head	6½ c	3 quart	8-10 min.
4. Peas	4 cups	1-1½ c	2 quart	20 min.
5. Potatoes	3 medium	4 c	2-3 quart	25-30 min.
6. Turnips	3 medium	8 c	4 quart	20-25 min.

3. Why do some vegetables require more water than others?

4. In what ways is water used in cooking in the home?

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

UNIT III. HOW TO CARE FOR WASTE PRODUCTS OF THE HOME.

Problem 1. How shall we plan for the disposal of waste products in our homes and community?

Equipment and Materials:
Dishes of sterile agar (2)

Exercise 1. To know the waste products of the home and community.

Directions: List all the waste products of the home and community.

Waste Products of	
Home	Community
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.

Exercise 2. To know the best method of disposing of dirt and dust in the home.

Directions:
a. Expose a dish of sterile agar in a room while sweeping and dusting with a cloth without any oil.
b. In another room expose a dish of sterile agar during the same process but using a dampened broom and an oiled cloth for dusting. Put both dishes away in a dark, warm place for three or four days. Compare the number of colonies.

Comparison of the number of colonies:
Number of colonies in (a)_____
Number of colonies in (b)_____

Answer the following questions:

1. Which home will have a better chance of fighting disease germs, the one that uses a damp broom to sweep and an oiled cloth to dust or the one that does not?

2. Which home will be the more sanitary, the one in which children are taught to wipe their feet outside the house, or the one in which the dirt is brought into the house?

3. Why is it better to use a vacuum sweeper than a broom?

4. What would be a satisfactory method of disposing of the dirt after you have picked it up from sweeping?

5. What would you do with the dirt from the vacuum cleaner?

6. Which is the better method for towns to use, the wet or dry method of cleaning the streets? Why?

Exercise 3. To dispose of garbage in the home and community.

1. Define garbage.

2. How is garbage disposed of in your home?

3. How can the one who takes care of the garbage help in making the process more sanitary?

4. How do large cities take care of the garbage?

5. Why do micro-organisms grow rapidly in garbage?

Exercise 4. To study the methods of sewage disposal.

In the country home:

A. Earth toilet:

1. Where should the toilet be located?

2. Why is it essential to keep the toilet covered?

3. Why is chloride of lime used?

B. Chemical toilet:

1. What kind of solution do you find in the pail that receives body wastes?

2. How often should the contents of the pail be emptied?

3. Where is the contents emptied?

4. Why is a chemical toilet more sanitary than an earth toilet?

C. Dry earth toilet:

1. How does a dry earth toilet differ from the old earth type?

2. How is the dry earth toilet made more sanitary than the old earth toilet?

D. Cess pool:

1. What habits are a family likely to practice without a drain pipe of some kind?

2. Where should the cess pool be located?

3. What are some precautions that should be taken in regard to the cess pool?

E. Septic tank:

1. How does a septic tank differ from a cess pool?

2. Why is the septic tank the most successful method of sewage disposal?

In the city:

1. What different methods do cities use in their sewage disposal?

2. Why is the problem more complicated in the city than in a rural home?

Problem 2. How shall we judge the method of waste disposal in our homes?

Exercise 1. To make a survey of the methods used in disposing of waste products.

1. Make a survey of the method used in your homes for disposing of waste products. Compare with the members of your class. Tabulate class findings.

Waste Product	Method
Dirt	
Waste water, as dish water, wash water, etc.	
Garbage	
Papers	
Tin cans	
Body wastes	

Exercise 2. To judge the method of disposal of waste products.

1. Plan a score card for judging waste disposal and score your home practices with it.

UNIT IV. PROVIDING HEAT AND FRESH AIR IN OUR HOMES.

Problem 1. How is heat transferred?

Equipment and Materials:

Tin can (1)	Sauce pan with metal handle (1)
Candle (1)	Sauce pan with wooden handle (1)
Nail (1)	Punk or paper (1 piece)

Exercise 1. To show how heat travels by radiation.

Directions:

a. Take a common tin can. Fill with boiling water. Hold your hand near the sides of the can.

b. Light a candle. Hold your hand above the flame. Hold your hand at the sides of the flame.

1. In what directions did you feel heat?

Exercise 2. To show how heat travels by conduction.

Directions:

a. Hold a nail in a flame.

b. Put some water in sauce pan with a metal handle and hold over a flame.

c. Do same with sauce pan with a wooden handle.

1. What happened in each case?

Nail:

Sauce pan with metal handle:

Sauce pan with wooden handle:

2. Which article was the best conductor of heat?

Exercise 3. To show how heat travels by convection.

Directions: Light a candle. Hold a piece of burning punk or smoking paper above the flame.

1. What direction did the particles of smoke go?

2. Why is it hotter above a stove than under it?

3. Why is the top of an open stairway warmer than the hall?

Make a list of as many instruments or devices as you can in which heat travels by:

Convection	Conduction	Radiation

Problem 2. How are the different types of stoves operated?

Equipment and Materials:
Diagrams of different types of stoves
Bunsen burner or gas stove

Exercise 1. To study a wood or coal stove.

Directions: From a diagram in your science book study the parts of a wood or coal stove, either a heating stove or cooking range. If you have a stove in the laboratory locate the parts and find out how to adjust the dampers.

1. Build a fire in a wood or coal stove either at school or at home.

Exercise 2. To study a kerosene stove.

Directions: If a kerosene stove is available take apart and examine the parts.

1. What are the parts of a kerosene stove?

2. How is the amount of heat produced?

Exercise 3. To study a gas stove.

Directions: Find the air regulator at the front of a gas burner. Shut off the air from one burner. Compare the flame of the burner that has the air shut off with one that does not.

1. What effect did shuting off the air have on the color of the flame?

2. Which flame gave the most heat?

3. How is gas that is used in heating or cooking measured?

4. Find a gas meter and read it.
   a. How many circles on the meter?

   b. Make a copy of the dial showing the positions of the hands.

   c. How many cubic feet of gas has been used?

   d. Several days later read and record again.

Exercise 4. To study the furnace.

1. What are the different types of furnaces?

2. How does a furnace differ from a stove?

Problem 3. How shall we judge our heating system?

Exercise 1. To judge heating systems at home and school.

Directions: Examine the heating system at home. At school.

1. What is the source of heat?
   Home
   School

2. Where is the heater located?
   Home
   School

3. How is heat distributed to the rooms?
   Home
   School

4. How is the heat regulated?
   Home
   School

Fill in chart:

Type of heat	Advantage	Disadvantage
1. Wood stove		
2. Coal stove		
3. Gas heater		
4. Hot air furnace		
5. Hot water furnace		
6. Steam furnace		

From this study give reasons for the adequacy or inadequacy of home and school heating devices.

Problem 4. How shall we ventilate our homes?

Equipment and Materials:
Wooden box (12"x 8"x 8")
Piece of glass to fit one side of box
Corks (8)
Candles (2)
Punk
Thermometers (2)

Exercise 1. To show the air currents in ventilating a room.

Directions: Take a wooden box about 12"x 8"x 8". Fit one side with a piece of glass. To represent windows bore four holes in each end, two at the top and two at the bottom. Fit a cork in each opening. In the box put two candles about 6 inches from either end. Light candles. Close glass front. Try different combinations of removing corks, that is, open holes at bottom of one end and top of the other, open all holes at upper part, open all holes at one end, open all holes at the bottom. Each time study the air currents by putting a piece of burning punk at the opening. Record your results.

Method	Direction of air current
1. All holes plugged	
2. Holes at bottom of one end and top of other open.	
3. All upper holes open	
4. All holes at one end open	
5. All holes at bottom open	

1. Which is the best way to ventilate a room? Why?

Exercise 2. To know the best way of ventilating a room.

Directions: Light some punk. Hold it at open windows. Try with different combinations; windows open at bottom and top, windows open at bottom, windows open at top.

1. Which method gave the best result?

2. Why would you recommend using this method?

3. What does satisfactory ventilation involve?

Exercise 3. To find the relative humidity of the room.

Directions: Fasten two thermometers to cardboard. Keep one bulb wet by keeping a soaked cloth around it with one end left free and extending into a bowl of water. Keep the other bulb dry. Fan apparatus vigorously for 3 or 4 minutes. Read the temperature of both thermometers. Find the difference and check percentage with table. Example, if the dry reading is 70° F. and the wet reading is 60° F., the difference is 10°. Follow the line across from 70 until it meets 10°, the figure 56 which is the percentage of humidity.

Relative Humidity Table

Dry bulb Readings	Difference between thermometers														
	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°
60°F	94	89	84	78	73	68	63	58	53	49	44	40	35	31	24
62°F	94	89	84	79	74	69	64	60	55	50	46	41	37	33	29
64°F	95	90	85	79	75	70	66	61	56	52	48	43	39	35	31
66°F	95	90	85	80	76	71	66	62	58	53	49	45	41	37	33
68°F	95	90	85	81	76	72	67	63	59	55	51	47	43	39	35
70°F	95	91	86	81	76	72	68	64	60	56	52	48	44	40	37
72°F	95	91	86	82	77	73	69	65	61	57	53	49	46	42	39
74°F	96	91	86	82	78	74	70	66	62	58	54	51	47	44	40
76°F	96	91	87	83	78	74	70	67	63	59	55	52	48	45	42
78°F	96	91	87	83	79	75	71	67	64	60	57	53	50	46	43

1. What is the relative humidity of the room?

2. What is the best humidity for comfort and health?

3. What effects are noticeable if there is not proper humidity in a room?

4. How could the humidity be altered if not right in a room?

Problem 5. How shall we control temperatures in the home?

Equipment and Materials:
Fahrenheit and Centigrade thermometers
Electric fan

Exercise 1. To know the thermometers.

Directions:
a. Examine a Fahrenheit thermometer. What are its parts?

b. Examine a Centigrade thermometer. How does it differ from a Fahrenheit?

Put some water in a pan and boil with the bulb of both thermometers in water. Put some ice and water in a jar and test temperature with both thermometers. Take the temperature of the room with both thermometers. Record results.

	Degrees of F.	Degrees of C.
Boiling		
Freezing		
Room		

1. How many Fahrenheit degrees are equal to one Centigrade degree?

2. Where are each of these thermometers used?

3. If you had a Centigrade thermometer and the temperature of the room measured 20°, how much would that be in Fahrenheit?

4. How from readings, do you know whether it is a Centigrade or Fahrenheit scale?

Exercise 2. To study devices that help control the temperature in the home.

Directions:

a. Observe the school thermostat or the regulator on a gas oven.

1. What is a thermostat?

2. Where are thermostats used?

3. Of what advantage is a thermostat?

b. Study an electric fan. Wring a towel out of water and hold in front of the fan. Note any changes of temperature.

1. Why does an electric fan make a room cooler?

2. What change did you notice when the wet towel was hung in front of the fan?

c. If possible visit some building that has an air-conditioning plant.

1. What is air-conditioning?

2. List ways that our homes could be made cooler in the summer.

UNIT V. HOW TO HAVE A WELL-LIGHTED HOME

Problem 1. How shall we plan for proper lighting in our homes?

Equipment and Materials:

Mirror	A table
Pieces of cardboard (2)	Pasteboard box with small open
Plain glass to fit box	Candle
White lamp shade	Large piece of dark paper (2)
Dark room	Kerosene lamp
Small electric lamp	Gas lamp

Exercise 1. To study the reflection and diffusion of light.

Directions: Place the box over the light. Hold a mirror in the light rays and tilt. Replace mirror with piece of cardboard. Next put plain glass over small opening. Replace with white lamp shade.

1. What effect did the mirror have on the light rays?

2. What effect did the pasteboard have on the light rays?

3. What happened when the plain glass was put over the opening?

4. What happened when the white lamp shade was placed over the opening?

Define:

Transparent:

Translucent:

Opaque:

Exercise 2. To study relation between the amount of light and the distance from the source.

Directions: Place a candle on a table in a darkened room. Hold a piece of cardboard with a hole one inch square. Place a larger piece of dark paper two feet away. Measure the space lighted by the light rays that pass through the hole. Try other distances.

1. What is the relation between the intensity of light and the distance from its source?

2. When do you need the light close at hand?

3. When could a light be far away?

Exercise 3. To study various kinds of artificial lights.

Directions: If possible compare the amount of light given off by the various kinds of artificial lights. Light the following in a dark room: candle, kerosene lamp, gas light, electric light.

1. Which one gives the most light?

2. Why do all the rest give more light than the candle?

Problem 2. What are the effects of color and texture on lighting?

Equipment and Materials:
Wire lamp frame
Pieces of colored materials of different textures
Samples of wall paper

Exercise 1. To know the effect of color and texture on light.

Directions: Stretch the different pieces of materials over wire frame. Note results.

1. What effect did lighter tints and thin materials have on the light?

2. What effect did the darker shades and heavy materials have?

Exercise 2. To know the effects of wall coverings on light.

Materials: Samples of wall paper. Samples of wall finishes.

Directions: Hold samples in path of the source of light in a room. Note results.

1. What effect does dark wallpaper have on light?

2. What effect does light wallpaper have on light?

3. What effect does a shiny surface have on light?

Problem 3. How shall we determine the best place for our lighting fixtures?

Exercise 1. To determine the right way to use natural lighting.

Directions: Try seating yourself in different positions at the window for the best light.

1. What is the best way to receive light from the window?

Exercise 2. To determine the best place for artificial lights.

Directions: Tonight when you are studying at home, if you have a kerosene lamp or gas lamp, try different positions of the lamp and report to class tomorrow. If you have electric lights, go to different parts of the house where different methods of lighting are used and see where is the best place to study, and report.

1. What was the best location of the light for you to study?

2. Over which shoulder should light come if you are reading?

3. Where should the light be if you were writing?

Problem 4. How shall we plan the lighting for the various rooms in our homes?

Equipment and Materials:
Examples of direct, indirect, and semidirect lighting.

Exercise 1. To try the 3 methods in various places.

Directions: Try out the three methods of lighting. Note the results.

1. How do these various methods compare?

Exercise 2. To plan the lighting for the various rooms.

Directions: Plan the proper lighting for each of the following rooms.

1. Kitchen
2. Dining room
3. Living room
4. Bathroom
5. Bedroom

UNIT VI. GETTING THE MOST FROM OUR HOUSEHOLD EQUIPMENT.

Problem 1. How shall we classify equipment used in the home?

Exercise 1. To classify equipment in the home.

Directions: Think of the different rooms in your house and think of the equipment that helps do work. Classify the equipment in the following way:

Equipment in the Home					
Kitchen	Dining Room	Living Room	Bedroom	Bath-room	Laundry

1. How many pieces of equipment did you find in each?

a. Kitchen _____
b. Dining room _____
c. Living room _____
d. Bedroom _____
e. Bathroom _____
f. Laundry _____

2. What is some equipment used in running the house not mentioned in the table?

Exercise 2. To classify equipment as to types of machines.

Directions: Machines may be classed as simple machines including; levers, pulleys, wheel and axle, inclined planes, and wedges, or as power machines. Look over your equipment list and fill in the following table. Put levers of 1st class, 2nd class, and 3rd class in proper place. In power machines give source of power.

	Types of Machines					
Levers	Pulleys	Wheel & Axle	Inclined plane	Wedge	Power	Source of Power
1st Class						
2nd Class						
3rd Class						

1. What is a machine?

2. What is the law of the machine?

Problem 2. How shall we test the officiency of the equipment in the home?

Equipment and Materials:

Nail	Chalk box
Yardstick	Spools
Wooden blocks (2)	Board (3 ft. long)
Weights	Bag salt (1 lb.)
String	Loads of 2 lbs. and 3 lbs.
Scissors	Knife
Nut cracker	Pieces of cheese
Sugar tongs	Cutting board

Exercise 1. To study the lever.

Directions: Drive a nail through the center of a yardstick. Balance it between two wooden blocks.

a. Hang any article on left side of fulcrum. On the right side hang another article of different weight so that it will exactly balance. Note the distance of each from the fulcrum and the weight of each article.

b. Hang two articles of same weight, one on left side of fulcrum and other on right side so as to form perfect balance. Again notice the distance each was from the fulcrum.

c. Hang a weight on the left side of fulcrum. On the right side hang two smaller weights to balance. Notice the weight of articles and distance from fulcrum of each article. Record your observations:

	Weight on left side	Distance on left side	Weight on right side	Distance on right side
(1)				
(2)				
(3)				

1. What is the law of the lever?

2. How would a girl weighing 100 pounds "teeter" with a girl weighing 130 pounds?

Exercise 2. To study the advantages of a lever.

Directions: Tie a piece of string from some support and hang a yard stick from it. Tie a heavy weight on one end. The weight is the resistance, the fulcrum is the point where the stick is held by the string, and your hand on the other end of the stick is the force.

a. Move the fulcrum near the weight. Balance it with your hand.
b. Move the fulcrum near the force and balance the weight.

1. Which could you balance the weight easier?

2. In (a) or (b) did your hand or weight move faster?

3. In (a) or (b) which moved the farther, your hand or weight?

4. What are the advantages of a lever?

Exercise 3. To study the three types of levers.

Directions:
a. Study a pair of scissors. Use them to cut.
b. Study a nut cracker. Crack a nut.
c. Study the sugar tongs. Lift a lump of sugar.

Answer the following questions about each:

Where is the fulcrum?
Where is the resistance?
Where is the force?

A. Scissors
(a) Fulcrum_____
(b) Resistance_____
(c) Force_____

B. Nut cracker
(a) Fulcrum_____
(b) Resistance_____
(c) Force_____

C. Sugar tongs
(a) Fulcrum_____
(b) Resistance_____
(c) Force_____

1. What are the parts of every lever?

2. Which type of lever needs a greater force than resistance?

3. Which type of lever needs a smaller force than resistance?

Exercise 4. To study the inclined plane.

Directions: Make a small car from a chalk box using spools for wheels.

a. Take a smooth board about 3 feet in length and raise one end 6 inches from the table. Weigh your chalk box car and put in 1 lb. bag of salt. Fasten a cord to box and to a spring balance. Pull the load up the board.

b. Repeat using a load of two pounds and three pounds. Make the height of the plane one foot and repeat. Record your data.

Height of Plane	Length of Plane	Load Box plus Weight	Effort	Input Length times Width	Output Load times Height
1.					
2.					
3.					

4.					
5.					
6.					

1. What is the mechanical advantage of an inclined plane?

2. How do inclined planes aid us in our work?

Exercise 5. To study the wedge.

Directions: Observe a knife. Cut a piece of cheese first by holding the knife above cheese and cutting straight down. Now rest the point of knife on cutting board and bring handle of knife down, thus bringing sharp edge of knife through cheese.

1. Which method was easier?

2. Which other type of machine does the knife resemble?

Problem 3. How shall we repair equipment in our homes?

Equipment and Materials:
Electric iron cord
Friction tape, bicycle tape, or adhesive tape
Fuses
Window shade

Exercise 1. To splice an electric cord.

Directions:
a. Remove cord from service outlet.
b. Skin insulation back one inch on wire on each end.
c. Scrape wires bright and twist together.
d. Solder and wrap each connection with friction tape, bicycle tape, or adhesive tape.

Splice an electric cord in class.

1. When would this information be of value to us?

Exercise 2. To repair plug in an iron or cord to a lamp.

Directions:
a. Remove cord from wall plug and from iron.
b. Take plug apart -- examine.
c. If broken wire is found, cut both wires the same length and make new connections.
d. Put back together.

If one contact is burned so that proper connection to iron or lamp can not be made, replace with new plug.

If possible, repair an iron or lamp cord in class.

Exercise 3. To test and replace a fuse.

Directions:
a. Pull service switch to cut off current.
b. Remove fuse and replace with new fuse.
c. Throw switch back in to test for lights.
d. If lights do not light, pull service switch again, take out other fuse and replace with first fuse taken out.
e. Throw switch back in.

Replace some fuses.

1. Why do you pull the switch before removing and replacing the fuse?

Exercise 4. To wind the spring in a window shade roller.

Directions:

a. Lift curtain and roller from fixture.
b. Wind shade up by hand.
c. Replace in fixture.
d. Pull shade to bottom of window. If this does not make proper tension, remove and wind shade partly up. Replace.

Wind the spring in a window shade.

Exercise 5. To turn window shade.

Directions:

a. Remove curtain and roller from fixture.
b. Take shade off roller.
c. Remove stitching from hem. Tack this end to roller.
d. Hem opposite end.

Turn some window shades.

Problem 4. How shall we care for equipment in our homes?

Exercise 1. To oil a machine.

Caution: Do not oil motors except only on recommendation of the manufacturer. These exercises are for machines and not motors.

Directions:

a. Each company will furnish you with directions for oiling their products.
b. Keep machine free from dirt and dust.
c. Apply oil to holes provided for oil.
d. Wipe off excess oil.

Oil as many of the following machines as possible:

(a) Sewing machine
(b) Washing machine
(3) Vacuum sweeper
(4) Ice cream freezer

1. Why is oil necessary for a machine?

Exercise 2. To care for washing machine and wringer.

Rules to follow:

a. Each time machine is used, rinse with hot water and dry.
b. Dry wringer and loosen roller.
c. To remove scum on sides of washer or wringer use kerosene.
d. Leave lid ajar to let air in.

1. What are the kinds of washing machines?

2. Why does a wooden washing machine require more care than a metal one?

Directions: Study the directions sent with an electric sewing machine, iron, refrigerator, or washing machine. Make out a list of rules you would use in caring for and cleaning the following pieces of equipment:

A. Flat irons
   1.
   2.
   3.
   4.
   5.
B. Electric irons
   1.
   2.
   3.
C. Gasoline irons
   1.
   2.
   3.
   4.
D. Brooms and Brushes
   1.
   2.
   3.
   4.
E. Carpet Sweeper
   1.
   2.
   3.
   4.
F. Vacuum Cleaner
   1.
   2.
   3.
   4.
G. Kerosene lamp
   1.
   2.
   3.
H. Any electric equipment as a toaster, percolator, or waffle iron
   1.
   2.
   3.
   4.
I. Cream separators (if you live in the country)

UNIT VII. HOW TO DO CLEANING IN THE HOME.

Problem 1. How shall we clean the various rooms in the house?

Equipment and Materials:
Soap flakes
Soft cloth
Lemon oil (3 T)
Turpentine (1 T)
Wall brush or broom
Wax

Exercise 1. To clean the various rooms.

Make some general rules for cleaning the house.

To clean any room:

Exercise 2. To clean painted surface.

1. Make a soap solution using:
   1 qt. hot water
   ½ c. white soap flakes
2. Wash painted surface with soft cloth.
3. Rinse with clean warm water and cloth.
4. Wipe dry.

Exercise 3. To clean a varnished surface.

1. Remove dust.

2. Make a solution using
   1 qt. boiling water
   3 T. lemon oil
   1 T. turpentine

3. Wring soft cloth from solution.

4. Wash small space at a time.

5. Dry with cloth immediately.

Exercise 4. To clean wall paper.

1. Dust walls frequently.

2. Use soft cloths over a brush or broom.

Exercise 5. To wash linoleum.

1. Remove dust.

2. Wash with a mild soap solution to which a little oil of lemon has been added.

3. Wipe up surplus water.

4. May rub with a few drops of liquid wax to each square foot of linoleum.

Exercise 6. To scrub a wood floor.

1. Sweep.

2. Use warm mild soap sud solution.

3. Rinse in clear water.

4. Wipe up surplus water.

Clean as many of the suggested things as possible.

1. Clean rest room or some other room in school.
2. Wash a painted surface.
3. Wash a varnished surface.
4. Scrub a floor.
5. Clean a linoleum.

Problem 2. How shall we clean the furniture and large pieces of equipment?

Equipment and Materials:

Ammonia
Knitting needle or stiff wire
Kerosene oiled cloth
Soft brushes
Washing soda (1 C)
Turpentine (few drops)
Linseed oil (few drops)
Denatured alcohol (few drops)
Wax

Exercise 1. To clean a refrigerator.

1. Remove all food and wire racks.
2. Wash racks with ammonia and water.
3. Wash inside of refrigerator with ammonia and water.
4. Rinse and wipe dry.
5. Cool and replace.

Exercise 2. To clean gas burners.

1. Remove burners.
2. Clean out holes with a knitting needle.
3. Soak in pan with 1 C of washing soda added to enough water to cover.
4. Boil out grease.
5. Rinse and wipe.
6. Rub with kerosene oiled cloth.
7. Replace and light. Burn until all parts are dry.

Exercise 3. To clean a kerosene stove.

1. Lay paper on floor.
2. Remove racks.
3. Remove shields from burners.
4. Trim and wipe off wicks.
5. Wash racks and shields in hot soap suds.

6. Wash stove with soap suds and wipe with kerosene.

7. Replace racks and shields.

8. Light burners to dry.

Exercise 4. To clean wicker.

1. Spray with cold water.

2. Clean with soft brushes in cracks and wipe dry.

Exercise 5. To polish wood.

1. Use equal parts of turpentine and boiled linseed oil.

2. Rub on against the grain of the wood and then in straight lines with the grain of the wood.

3. Rub thoroughly.

4. Repeat several times.

Exercise 6. To wax wood.

1. Remove any old wax with a soft cloth moistened with denatured alcohol.

2. Apply only a little wax and rub hard.

Clean the following:

1. The school refrigerator.
2. The school stove.
3. Polish the dining room table or some other piece of furniture.

Problem 3. How shall we clean the furnishings?

Equipment and Materials:
Carpet sweeper or vacuum cleaner
Broom
Whisk broom

Exercise 1. To clean a carpet or rug.

1. Use carpet sweeper or vacuum cleaner or good clean broom.
2. Sweep evenly across width of carpet or rug.
3. Overlap each time you go across.
4. Sweep well the edges and ends.
5. If using broom, use bits of paper moistened or old tea leaves to reduce dust.

Exercise 2. To clean curtains and draperies.

1. Take down frequently and air.
2. Hang over clothesline and brush with a whisk broom.
3. Curtains should be laundered every month or two.

Exercise 3. To clean upholstered furniture.

1. Brush with a whisk broom or clean with vacuum cleaner attachments.

Clean the following:

1. A carpet or rug.
2. Curtains or draperies at school.

Problem 4. How shall we clean household utensils?

Equipment and Materials:
Very fine steel wool
Lemon juice or tomato juice
Cleansing powder
Washing soda
Soap

Exercise 1. To clean aluminum

1. Wash with water and mild soap.

2. Use very fine steel wool to scratch off food that has stuck.

3. Use tomato or lemon juice to take off stain.

Exercise 2. To clean enamel.

1. Be careful not to chip enamel.

2. Wash and wipe dry.

3. Scour with fine cleansing powder.

4. Soak enamel pans with burned food in washing soda and water.

5. Boil, wash, wipe dry.

Exercise 3. To clean iron.

1. To remove charred or greasy food, soak with washing soda.

2. Boil until food loosens.

3. Wash with soap suds or use scouring powder.

4. Rinse with hot water.

5. Wipe dry.

6. To store, wipe with kerosene or waxed paper.

Exercise 4. To clean tin.

1. Wash with soap and water.

2. Rinse with hot water and wipe dry.

3. Scour with fine cleanser.

4. To brighten, heat in mild soda water for 5 minutes.

5. Always dry thoroughly.

Clean the following:

1. An aluminum pan
2. An enamel pan
3. An iron skillet
4. A tin pan

Problem 5. How shall we clean our silverware and other household metals?

Equipment and Materials:

Whiting or silver polish	Aluminum pan
Alcohol	Soda (2 t)
Lemon juice or	Salt (2 t)
Vinegar	Soap

Exercise 1. To clean silver.

A. Whiting method

1. Use whiting or chalk mixed with ammonia or alcohol to form a paste.

2. Apply to silver with soft cloth.

3. Allow to dry and rub off with soft cloth.

4. Rinse and polish.

B. Pan method

1. In an aluminum pan put soda and salt allowing one teaspoon soda and one teaspoon of salt to each quart of water.

2. Put the silver in the pan with salt and soda and pour over it the boiling water.

3. Allow silver to stand in hot water until bright.

4. Remove from pan. Wash in hot soapy water.

5. Rinse.

6. Polish with towel.

Exercise 2. To clean nickel.

1. Wash with soap and water.

2. Rinse in hot water.

3. Wipe dry.

4. Polish with whiting and ammonia paste.

Exercise 3. To clean pewter.

1. Wash with hot soap suds, rinse and wipe dry.

2. Polish with whiting with a little oil added.

Exercise 4. To clean copper and brass.

1. Use fine scouring powder.

2. Polish with cotton waste.

3. Use lemon juice or vinegar heated with a little salt to remove dirt or corrosion.

4. Wash and wipe dry.

Clean as many different metals as possible.

Problem 6. How shall we clean the glass in our homes?

Equipment and Materials:
Soap, alcohol, brush, ammonia, kerosene.

Exercise 1. To wash table glassware.

1. Use hot soapy water.

2. Wipe directly from suds or rinse in clear, hot water.

3. Wipe while hot with a towel containing no lint.

Exercise 2. To clean mirrors and pictures.

1. Be careful not to let water get under the frame.

2. Moisten with clear water and wipe dry, or moisten a soft cloth with a few drops of alcohol and clean.

Exercise 3. To clean windows.

1. Brush window sills with a brush.

2. Clean by any of the following methods:

   a. Use soft cloths and warm water containing a few drops of ammonia.
   b. Use warm water with a few drops of kerosene.
   c. Whiting moistened to a milky paste and allowed to dry.
   d. Wash with soapy water and rinsed, then wiped with chamois.

3. Polish glass with dry cloth.

Clean windows using different methods. Compare methods.

Problem 7. How shall we clean the china and porcelain in our homes?

Equipment and Materials:
Soap, water, whiting, kerosene.

Exercise 1. To wash china.

1. Use hot water and mild soap.

2. Rinse with hot water.

3. Dry.

Exercise 2. To clean porcelain (sink and table tops).

1. Use soap and non-scratchy cleaner.

2. Make solution using:

1 C water	2 T whiting
¼ C soap flakes	1 T kerosene

Make soap jelly and stir in whiting and kerosene.

3. Rust spots may be removed by lemon juice or vinegar. Rub spot with soap jelly and a few drops of acid.

Exercise 3. To clean the bath tub.

1. Scrub with soft brush using fine cleanser.

2. May use soap jelly.

3. Rinse with hot water.

4. Wipe dry.

5. If hard water leaves scum, remove with soap jelly or little kerosene.

6. Rinse and wipe dry.

7. Kerosene odor is destroyed by soapy water.

Make soap jelly and clean sinks.

Remove rust spots from porcelain.

Problem 8. How shall we rid the home of household pests?

Exercise 1. To know and rid the home of common household pests.

1. Make a study of the common household pests by:

Pests	Method of prevention	Method of exterminating

Exterminate some pests either at school or at home.

UNIT VIII. HOW TO SELECT AND CARE FOR OUR CLOTHING.

Problem 1. How can we make some common tests for the different fibers?

Equipment and Materials:
Samples of materials:
Cotton, linen, rayon, silk, and wool. (3 samples of each)

Microscope
Concentrated hydrochloric acid (5c.c.)
Lye (5 c.c.)
Chlorene bleach (5 c.c.)
Dye (1 package)

Exercise 1. To examine the appearance of the different fibers.

Directions: Examine cotton, linen, silk, rayon, and wool fibers under the microscope.

1. Describe the appearance of each.

cotton:

linen:

silk:

rayon:

wool:

2. Make a sketch of each fiber to show the appearance. Label each.

Exercise 2. To use the burning test.

Directions: Burn a sample of each of the following: Cotton, linen, silk, rayon, wool. Observe the rapidity of the burning, the odor, and the residue of the sample. Fill

in the table from your observations.

Sample	Rapidity	Odor	Residue
Cotton			
Linen			
Silk			
Rayon			
Wool			

Exercise 3. To use the chemical tests.

Directions:

a. Acid test. Cover samples of cotton, linen, silk, and wool with cold, concentrated hydrochloric acid. Let stand for 10 or 15 minutes. Examine.

b. Alkali test. Dissolve two teaspoons of lye in one pint of water. Put samples of cotton, linen, silk, and wool in the solution and boil for 5-10 minutes. Wash in water before handling. Examine.

1. Which samples were destroyed by the acid?

2. Which samples were least affected by the lye solution?

3. What would these tests show in doing the laundry?

Exercise 4. To test for rayon.

Directions:

a. Feel a piece of rayon material and silk material. Note the results.

1. Describe the feel of rayon. Of silk.

b. Press two or three samples of rayon materials with a hot iron. Note results.

1. What happened to samples when a hot iron was used?

c. Soak a piece of rayon material in enough chlorene bleach to cover for one-half hour. Dry. Note result.

1. What effect did the chlorene bleach have on the sample?

d. Place two or three samples of rayon materials in a dye bath. Boil for 5 minutes. Rinse, dry, and examine.

1. What were the results of the dye on the samples?

From this exercise what are the simple tests for rayon?

1.

2.

3.

4.

Problem 2. How shall we remove spots and stains?

Equipment and Materials:

Pieces of white cloth

Spot and stain removals

Gasoline	French chalk
Alcohol	Carbonate
Carbon tetrachloride	Hydrochloric acid (dilute)
Naphtha	Ammonium hydroxide
Benzine	Javelle water

Staining materials

Oil

Fruit juice--cherry, raspberry

Ink (non-washable)

Blotting paper (2 sheets)

Hot iron

Exercise 1. To remove spots and stains.

A. Dissolving the stain

a. Take a piece of white cloth about 3 inches square and drop some oil on it. Moisten a rag with one of the following: gasoline, alcohol, carbon tetrachloride, naphtha or benzine. Rub the spot until it disappears. If the first one you try does not remove the spot, try others until you find one.

b. Make a stain on a piece of white cloth with some fruit juice as cherries or raspberries. Pour boiling water through the cloth.

1. What was the result?

a.

b.

2. By what method were the stains removed?

B. Absorbing the stain.

a. Put a drop of oil on a piece of cloth. Cover the spot with powdered French chalk or magnesium carbonate. Allow to stand for several hours.

b. Put a drop of oil on a piece of cloth and put the cloth between two pieces of blotting paper. Press with a hot iron. Examine.

1. What was the result?

   a.

   b.

2. Why was the hot iron used?

3. What was the purpose of the blotting paper?

4. By what method was the oil removed?

C. Chemical action or bleaching

a. If possible secure an article with iron rust. Wet stain with water. With a glass rod drop a drop of dilute hydrochloric acid on the rust. Rinse in water. Drop a drop of ammonium hydroxide on the place where the spot was to neutralize the acid.

b. Put some non-washable ink on a piece of cloth. Make a weak solution of Javelle water by adding one teaspoonful to one quart of water. Soak cloth in it, rub the stain, and wash in clear water.

1. How were the stains removed?

Find some household linens or clothes at home with stains. Bring to class, analyze the stain, look up table in <u>Home Living</u> by Justin and Rust and remove the stains.

1. What are the steps in removing stains?

Problem 3. How shall we launder our clothing?

Equipment and Materials:

Mild soap flakes	Soiled linens
Silk garment	Starch
Wool garment	Bluing
Silk hose	Clothes to be laundered
Knitted sweater	

Exercise 1. To wash silk and wook garments.

1. Dissolve mild soap flakes in a little hot water. Make a heavy suds. Add to the water in which the garment is to be washed. Cool wash water to hand temperature.

2. Squeeze and press garment in suds.

3. Rinse in several waters, having the rinse water the same temperature as the wash water.

4. Squeese from the rinse water but do not wring with the hands.

5. Roll in towel to dry.

6. Iron when barely damp. Use a damp cloth between iron and wool garments.

Wash a silk dress.
Wash a wool garment.

Exercise 2. To wash artificial silk garments.

1. Follow same rules as for silk and wool garments.

2. Hose and undergarments may be hung to dry.

3. Use cool iron to press rayon.

In class:

1. Wash silk hose and under garments.
2. Press a rayon dress.

Exercise 3. To wash a knitted sweater or dress.

1. Measure garment before wetting.

2. Write down measurements.

3. Use same methods for washing as for silk or wool.

4. Lay washed garment on a towel and stretch to measurements.

5. Check measurements during drying process.

6. Do not dry in too hot or too cool a place.

Wash a sweater or knitted dress.

Exercise 4. To launder household linens.

1. Sort linens into fine table linens, bed linen, towels, and colored linens.

2. Examine for spots and stains and remove if any.

3. Wash white linens through two suds, first warm and second hot.

4. To make suds use 10 or 12 gallons of water and 3/4 C soap flakes and ¼ C of washing soda.

5. Rinse in hot water.

6. Rinse in cold water.

7. Colored linens are run through only one warm suds.

8. Hang on line straight.

9. Remove carefully from line and fold pieces that do not need ironing.

Exercise 5. To do the regular washing.

1. Name the steps in organizing and laundering the family's clothes.

2. If possible have a group demonstrate the laundering of a family's clothes.

Problem 4. How shall we store our clothing?

Equipment and Materials:
Wrapping paper

Exercise 1. To store different types of clothing.

General Directions:
a. Remove all spots.
b. Clean.
c. Fold and wrap like garments together.
d. Label each package.
e. Put away.

1. Give the correct method for storing a coat, a silk dress, and curtains.

2. If possible put away the clothes for a season.

Problem 5. How are fabrics dyed?

Equipment and Materials:
Dye
Silk material

Exercise 1. To dye fabrics.

1. Choose dye for fabric.

2. Use enamel pan.

3. Read directions on the package.

4. Follow directions.

Dye material for a scarf.
Remove the color from a piece of material and dye.

LABORATORY LESSONS FOR RELATED PHYSICLOGY

UNIT I. KEEPING OURSELVES IN GOOD HEALTH.

Problem 1. How shall we score our health?

Are you as attractive as nature intended you to be? Score yourself.

(The Journal of Educational Method, March 1925. Teacher Training and Health Education. Mary L.Preston, State Teachers College, San Francisco, California.)

Points: My Score:

5 (a) Hair - "A woman's chief glory lies in her hair". _____

5 - glossy and free from oil. Not dry and brittle.

5 (b) Eyes - "Eyes that sparkle like stars at night". _____

2 - bright, sparkling, alert. Not dull and heavy.
1 - not strained; no puckery lines or frowns.
2 - clear white of eye; not muddy or yellow.

5 (c) Mouth - "Smile and the world smiles with you". _____

2 - pleasing expression.
3 - no mouth breathing.

5 (d) Teeth - "The charm of your smile comes in your teeth". _____

3 - well cared for.
2 - teeth meet properly.

10 (e) Skin - "A skin you love to touch". _____

2 - clear without eruptions.
2 - good color, not anemic.
1 - moist and smooth; not dry and scaly.
2 - tissues firm and elastic; not flabby or soggy.
2 - skin under eyes smooth and clear; not dark and baggy.
1 - lips naturally red.

5 (f) Hands - "Beauty at your finger tips". _____

3 - skin immaculately clean, smooth, without abrasions or cuts.
2 - nails and cuticle clear and carefully cared for. (No extremes)

5 (g) Feet - "A foot of comfort means miles of happiness". _____

3 - normal (of good shape). Shoes worn evenly on heels and sole.
2 - feet properly shod. (No extremes)

10 (h) Posture -- Graceful carriage. _____

1 - head well poised.
1 - shoulders level. (One shoulder not higher than the other)
1 - graceful body line, unbroken by abdomen. Chest high.
1 - feet in good position, slightly apart and parallel.
1 - arms in graceful relaxation. Good lines and grace while seated.
1 - lower spine against chair back.
1 - knees almost touching each other.
1 - feet parallel or one crossed over the other. Harmony of movement while walking.
1 - an elastic step -- firm, not heavy.
1 - good rhythm of entire body.

10 (i) Correct weight for age and height. (See tables) _____

10 (j) Good hearing. Can you hear ordinary conversation at 16 feet? _____

10 (k) Good vision. Can you read ordinary print at arm's length without straining?

Can you read the usual billboard sign across the street? _____

20 (1) The All Important First Impression. _____

5 - radiating good health and spirits. (Full of enthusiasm and interest)
5 - poise. (A perfect control of self, often inspiring others with confidence and admiration)
5 - voice. (The depth, the warmth, the force of your personality should speak through your voice)
5 - pep. (The power that makes the world's wheels go round)

_____ _____

100

Is your score what you would like it to be? If not, why not remedy it? "Health Makes Beauty".

Problem 2. How shall we use a health record sheet?

Directions: Use this score card for six weeks. Look over score each week and make improvements on your score.

Lincoln High School Health Score.
Home Living - Justin & Rust.
(Mrs. Marjorie Nichols Shea of the Abraham Lincoln High School, Los Angeles, California)

Name_____ Date_____ Score_____ Actual wt____ Correct wt____

Did you today?	Mon	Tu	Wed	Thu	Fri	Sat	Sun
1. Eat two fresh vegetables, one uncooked? (Do not count potatoes)							
2. Eat fruit twice, fresh, canned or dried?							
3. Eat a whole grain bread or cereal for breakfast?							
4. Eat a protein, meat, cheese, fish, or eggs?							
5. Take one pint of whole milk?							
6. Drink at least four glasses of water?							
7. Drink coffee or tea?							
8. Eat regularly and slowly?							
9. Eat nothing between meals except fruit or milk?							
10. Wash your hands before each meal?							
11. Take a bath?							
12. Brush teeth twice a day?							
13. Recreation in the open air at least a half hour?							
14. Attempt to improve posture three times a day?							
15. Rest at least 15 minutes?							
16. Sleep 9 hours with windows open?							
17. Have one bowel movement without medicine?							
18. Get angry, irritable or fretful?							
19. Catch cold?							
20. Follow your regular daily routine?							

Deductions from perfect score							
Total day's score							
Week's score							

Directions for Using Health Score Card.
Each of the twenty parts has a value of five.
Make deductions from the perfect score as follows:

1. One vegetable instead of two	2½
2. Fruit once a day	2½
3. No whole grain bread or cereal	5
4. No protein	5
5. One cup of milk instead of two	2½
6. Two glasses instead of four	2½
7. Tea or coffee, each	2½
8. Hurry at meal time	2½
9. For candy, cake or sweets	5
10. Once instead of three times	5
11. No bath	5
12. Brushing the teeth once	5
13. Recreation less than 20 minutes	5
14. Conscious attempt only once	5
15. Less than 15 minutes rest	5
16. For each hour of sleep less than nine	5
17. No natural bowel movement	5
18. Angry, irritable, fretful, each	2½
19. Catch a cold	5
20. For not eating at regular times or not going to bed at regular time	2½

Problem 3. How can we form some good health habits?

1. How are habits formed?

2. Look over score card in problem 2. Do you have any habits that you want to overcome? If so, plan a way in which you can overcome the habit.

3. Select a health habit that you would like to cultivate. Make plans for forming this habit.

4. Report from time to time on progress of the habit.

UNIT II. HOW BODY STRUCTURE AND MOVEMENT ARE RELATED TO HEALTH.

Problem 1. What are the characteristics of a cell?

Equipment and Materials:
Microscope
Slides (1)
Orange (1)

Exercise 1. To know and examine the parts of a cell.

Directions:
a. If a microscope is available, prepare some slides by mixing scrapings from the mucous lining of the mouth with water. Slides already made may be available in your school for study. If no microscope, study diagrams.
b. Take an orange. Peel, divide into sections and pull apart each tiny part to understand the make up of a cell.

1. What is a cell?

2. What kinds of cells are there?

3. What are the parts of a cell?

4. What is the function of a cell in any structure?

Problem 2. How can we have good posture?

Hold your body erect with your head and chest high for good posture.

Posture:

A. Standing:
1. Stand erect.
2. Body well balanced with weight on three points of the feet.
   a. the heel
   b. the base of the large toe
   c. the base of the small toe
3. Feet parallel, two or three inches apart.
4. Chest and head up, chin in.
5. Abdomen in.
6. Normal inward curve of back.

Note: An easy way to test correct standing position is to stand with back against the wall and note the parts of the body that touch. The heels, the calves, buttocks, shoulders, and head should touch the wall. Not more than two inches of space between wall and small of back. When facing the wall only the toes and chest should touch it, and the nose at least 1½ inches from the wall.

B. Sitting:
1. Sit erect and squarely on chair.
2. Hips well back in chair.
3. Entire back touching back of chair.
4. Feet flat on floor.
5. If the work requires leaning forward, bending should be at the hips and not at the waist.

Note: Proper seats and chairs are necessary for correct sitting posture.

C. Walking:
1. Feet parallel.
2. Weight carried on outside of feet.
3. Chest up.
4. Let arms swing easily.

1. Describe your posture as good, average, poor.

2. What causes poor posture?

3. How can you have good posture?

Problem 5. What exercises shall we take?

Note: For sports and out-door exercise, choose one that you enjoy.

A. Exercise for the hands.

1. Relax the hands completely. Hold the arms out horizontally and shake the hands for several minutes. Allow fingers to move freely.

   a. Exercise your wrists by rotating. That is palm of hand parallel with floor, then turn hand back as far as possible. Repeat 50 times with each hand.
   b. Holding the hands up, spread the fingers, first holding thumb and three fingers together and separating the little finger as far as possible, and so on with each finger.
   c. Holding the hands up, clench the fist hard and open, allowing fingers to spread out as far as possible.

B. Posture exercises.

1. Swing arms forward upward to the ceiling.
2. Face palms forward upward to the ceiling.
3. Rise on toes as high as possible.
4. One up, two down -- arms sideways, downward. Deep breath in on one and out on two.

C. Exercises for foot.

1. Walk on toes.
2. Walk on line one foot directly in front of other.
   a. First on entire foot
   b. On outside of foot only
3. Slowly raise and lower body on toes.

Problem 4. What are correct working surfaces?

Equipment and Materials:

Exercise 1. To find the correct working surface of various pieces of equipment.

Directions: Stand erect and hold the upper part of the arm close to the body. Bend the arm at the elbow. The distance from the floor to the elbow minus two inches gives the correct working height.

Note: The bottom of the sink should be the height of a table top.

1. What is the correct height for working surfaces for you? Take measurement and record.

2. What is the height of the following pieces of equipment at which you work? Compare with correct height for you.

Equipment	Height	Correct height
1. Foods table		
2. Stove (individual)		
3. Range		
4. Sewing table		
5. Ironing board		

3. If there are several people working at the same table, how should the correct height be determined?

4. Why is it essential to have correct working surfaces?

5. What could we do to equipment to have the correct height?

Exercise 2. To find the correct height of chairs.

Directions: Work together in groups of two. With feet flat on the floor, measure the length of the leg from the floor to the under surface of the bend of the knee. Measure from the top of the forward edge of the seat of the chair to the floor.

Note: The leg measurement should be one inch more than the chair measurement.

Record: Leg Measurement _____

Chair Measurement_____

1. Is your chair the correct height?

Problem 5. How do muscles aid our bones in their work?

Equipment and Materials:
Chicken wing or
Leg and thigh of chicken

Exercise 1. To find the relationship of the muscles to the bones.

Directions: Study a chicken wing or the leg and thigh of a chicken.

1. How do bones and muscles work together?

2. In what parts of the body do we find muscles and bones cooperating, especially?

3. List the parts of the body where the muscles act upon the bones as a lever. Tell what class lever each is.

Part of Body	Class of Lever

Problem 6. How shall we test for composition of bones?

Equipment and Materials:
Chicken bones or
Rib of hog
Hydrochloric acid (10 c.c.) or
Vinegar (¼ C)

Exercise 1. To study the composition of a bone.

Directions:
a. Take a chicken bone or a rib bone of a hog. Be sure to remove all muscles and connective tissue from the bone. Place bone in a jar and let soak in dilute hydrochloric acid or vinegar. After several hours remove the bone from the acid.
b. Burn a bone.

1. What changes do you find in the bone?

2. Of what are bones composed?

3. What happened to the bone that you burned?

4. What difference in the bone did this show?

Problem 7. How shall we plan diets that will aid in good bone and muscle development?

Exercise 1. To plan a diet adequate for bone and muscle development.

Directions: From your foods book find out what foods build bones and muscles.

a. List foods to include daily in your diet to insure proper development of bones.

b. List foods to include daily in your diet for healthy and well developed muscles.

c. Plan a day's diet to include the essentials for bone and muscle development.

UNIT III. HOW FOOD IS USED BY OUR BODY.

Problem 1. What are our food requirements?

Exercise 1. To study my food.

Directions: Keep a record of the food you eat for five days. Look up in your foods book and check it for the following items: calories, vitamins, minerals. Make record sheets for recording your food intake for the other four days.

First day	Calories	Vitamins	Minerals
A. Breakfast			
B. Noon			
C. Evening			
D. Between meals			

1. How does your record sheet compare with an adequate diet?

Exercise 2. To plan my daily food requirements.

Directions: Look up in a foods book the amount of food you require daily and plan the meals for 5 days meeting your daily requirements. This includes calories, vitamins, minerals, and relative proportions of carbohydrates, fats, and protoins. Before beginning to work answer the following

questions:

1. Upon what does the amount of food one eats depend?

2. What foods should be used daily to insure all the needed foods in the diet?

3. Plan menus for five days that will give you your daily food requirements.

Menus for 1st day	Menus for 2nd day	Menus for 3rd day
A. Breakfast		
B. Noon		
C. Evening		

Menus for 4th day	Menus for 5th day
A. Breakfast	
B. Noon	
C. Evening	

Energy Requirements

Average total energy requirements of boys and girls based on average weights and the average daily energy requirements per unit of body weight.

Age -- years	Calories per day: Boys	Girls
10	2100-2700	1900-2600
11	2100-2300	2000-2800
12	2300-3000	2100-3000
13	2500-3300	2300-3400
14	2600-3800	2400-3000
15	2700-4000	2400-2800
16	2700-4000	2200-2800
17	2800-3800	2100-2800

Daily energy allowance per unit of body weight for young and middle aged adults:

	Calories per pound
Without exercise	14 - 16
With light exercise.	16 - 18
With moderate exercise	18 - 20
With hard muscular labor	20 - 23
With very severe labor	23 - 27

Problem 2. What changes do enzymes make in our food?

Equipment and Materials:

Cracker (1)
Test tubes (4)
Thermometer
Iodine (few drops)
Egg white (1)
Hydrochloric acid (1 c.c.)
Pepsin ($\frac{1}{2}$ c.c.)
Milk (2 c.c.)
Rennet (1 c.c.)
Salt (1 gm.)
Pancreatin ($\frac{1}{2}$ gm.)
Sodium Carbonate ($\frac{1}{2}$ gm.)
Cornstarch (1 T)
Fehling's solution (5 c.c.)

Exercise 1. To study the effect saliva has on starch.

Directions: Crumble a cracker and add enough water to form a paste solution. Place some in two test tubes, A and B. Chew a piece of cracker thoroughly. Put in two test tubes, C and D. Keep test tubes at body temperature (98.6°F.) by placing in water. Leave for 20 minutes. Add a few drops of iodine solution to A and C. Test tubes B and D test for sugar using Fehling's solution.

1. What happened in each test tube?

A.
B.
C.
D.

2. What does this show?

Exercise 2. To study the effect of gastric juice on egg white.

Directions: Put a little of a white of an egg in a test tube. Add 2 c.c. of water and shake. Fill the remainder of the test tube with artificial gastric juice. Place the tube in water at body temperature and leave for 15 or 20 minutes. Observe the results.

Note: To make gastric juice use 1 c.c. of hydrochloric acid, $\frac{1}{2}$ c.c. of pepsin, 200 c.c. of water.

1. What was the appearance of the egg white in the water?

2. What was the difference in the appearance after it had stood with the gastric juice added?

3. How do you explain the change?

4. Where is gastric juice found in the body?

5. What food element does gastric juice digest?

Exercise 3. To study the effect of rennin on milk.

Directions: Place a small amount of milk in a test tube and heat it to body temperature. Add 1 c.c. of rennet. Set the tube aside for a few minutes. Rennet may be obtained from any druggist.

1. What happened to the milk?

2. What two familiar substances were formed?

Exercise 4. To study the effect of pancreatic juice.

Directions:

a. Repeat the exercise 2 but use artificial pancreatic juice instead of gastric juice. Pancreatic juice is made by using 1 gram of common salt, ½ gram of pancreatin and ½ gram of sodium carbonate with 150 grams of water.

b. Test a starch paste with pancreatic juice. Then test that mixture for sugar, using Fehling's solution.

1. What was the action of the pancreatic juice on the egg white?

2. What effect does pancreatic juice have upon starch?

3. Where are the following digested?

Starch _____
Sugar _____
Proteins _____
Fats _____

Problem 3. What path does our food take in digestion?

Exercise 1. To know our digestive tract.

Directions: Obtain a chart of the human digestive tract or use plate in physiology book. Study.

1. What are the organs of the digestive system?

2. Describe the process by which food is taken from the mouth to the stomach.

3. In what cavity do we find most of the digestive organs.

4. Where are the intestines located?

5. What are the two functions of the large intestines?

Problem 4. How is our food absorbed?

Equipment and Materials:

Egg (1)	Sugar (few grains)
Glass tube (1)	Filter paper (1)
Wide mouth bottle (1)	Sand (few grains)
Paraffin (small piece)	Test tube (2)

Exercise 1. To study the process of absorption by diffusion through a membrane.

Directions: Carefully remove the egg shell from the end of an egg without breaking the membrane. In the opposite end make a hole large enough to put in a glass tube and seal with paraffin. Fill a wide mouth bottle with water and put the egg into the mouth of the bottle so that the membrand touches the water. Examine in one hour.

1. What took place in the glass tube?

2. What is this process called?

Exercise 2. To further study the process of absorption.

Directions:

a. Put a few grains of sugar in a test tube half full of water. Shake well. Taste the liquid. Filter the liquid. Taste.

b. Wash a few grains of sand to remove dirt. Put in a test tube half full of water. Shake. Filter.

1. What were the results when you added sugar to water?

2. Did the sugar pass through the filter paper? Give reason for your answer.

3. What happened to the sand and water?

4. Did the sand pass through the filter paper? Why?

5. In what condition must food be before it will pass through the walls of the intestines?

6. By what means does the food reach the cells?

Problem 5. How is food carried to the different parts of the body?

Equipment and Materials:

Alcohol (few drops)	Heart of animal (1)
Needle (1)	Watch with second hand
Glass slide (1)	Microscope

Exercise 1. To study the nature of blood.

Directions: Sterilize your thumb with alcohol. Draw the skin tightly over the end and prick with a sterilized needle. Place a drop of blood on a glass slide and examine under the microscope. (If you do not have a microscope, use charts or diagrams)

1. What is the color of the corpuscles?

2. What is the function of the red corpuscles?

3. What is the function of the white corpuscles?

4. What other substances do you find in the blood?

Exercise 2. To study the circulatory system.

Directions: Examine the heart of some animal. The heart may be secured from the butcher shop. Locate the parts. Also use diagrams of the heart and circulatory system in your physiology book.

1. Describe the heart.

2. How many cavities does the heart have?

3. What are the names of the cavities?

4. What is the function of the heart?

5. Trace the complete circulation of the blood beginning at the left ventricle.

6. How long does it take the blood to make a complete round?

7. What is the lymph?

8. What is the function of the lymph?

9. Explain how food reaches the cells.

Exercise 3. To study the condition of the pulse rate.

Directions: Count pulse rate of your partner while she is sitting. Repeat three times and take the average. Now, run in place for 15 or 20 seconds. Take pulse. Keep taking until pulse rate returns to normal rate.

1. What was your normal pulse rate?

2. How long did it take your pulse to return to normal?

3. Of what is the pulse rate an indication?

4. Look up the table in your text and compare your findings. What would you say was the physical condition of your pulse rate?

Problem 6. How shall we make a digestion chart of foods?

Directions: Make a chart giving the following information:

Food	Enzymes	Where found	Changes

Problem 7. How shall we score our food habits?

Directions: Refer to your record sheets of food intake. Check with this food score card for one week.

Food Score Card

Food	Amount	Highest possible score	Score 1st day	2nd day	3rd day	4th day	5th day	6th day	7th day
Milk, including that used as beverages and with other foods	4 c.	20*							
Green vegetables	1 serving	10							
A second vegetable other than potatoes	1 serving	10							
Fruit, citrus. Additional fruit cooked or raw	1 serv. 1 serv.	10 5							
Whole cereal breakfast food or bread	2 servings	5							
Meat, egg, fish, poultry, cheese	1 serv.	10							
Fish or sea food once a week	1 serving	5							
Sweets at end of meal only		5							
Meals at regular hours		10							
Adequate breakfast		10							
TOTAL		100							

* 3 c. milk - 15
2 c. milk - 10
1 c. milk - 5

1. How does your food intake score?

2. What use should be made of a score card?

UNIT IV. HOW OUR BODY CARES FOR ITS WASTES.

Problem 1. How do the organs of excretion function in our bodies?

Equipment and Materials:
Lime water (5 c.c.) Kidney of an animal
Hand lens

Exercise 1. To study expired air.

Directions: Breathe into a bottle containing a little lime water. Note the result.

1. What waste product does the air that you breathe out contain?

2. Why does this waste product accumulate in the body?

Exercise 2. To study the skin.

Directions: Study diagrams of a cross section of the skin. Examine the surface of your skin with a hand lens.

1. Where are the sweat glands located?

2. What substances does perspiration contain?

Exercise 3. To study the structure and function of the kidney.

Directions: Obtain a kidney of some animal from the butcher. Cut the kidney lengthwise and observe structure.

1. Where are the kidneys located?

2. What is the function of the kidney?

3. How is the waste taken to the kidney?

4. Where does the waste from the kidney pass out of the body?

5. What foods may over work the kidneys?

6. What are organs other than the lungs, skin, and kidneys that excrete waste?

Problem 2. How shall we care for our skin?

Equipment and Materials:

Soap (face)
Wash cloth
Witch Hazel or
Alcohol (few drops)
Face cream
Cleansing tissue

Exercise 1. To care for one's face.

A. Washing face.

Rub a good soap on wash cloth. Rub face with cloth and soap forming a creamy lather. Rub with circular motion for a few minutes. Rinse in warm water, then in cold. An astringent such as ice, witch hazel or alcohol (mix alcohol with water) is good to finish.

1. Why does soap hurt some peoples' faces?

2. Why is soap necessary?

3. What is the object of rinsing in warm water followed by cold?

B. Cleansing the face with cream

Apply cream over face. Use a soft cloth or facial tissue to remove. Always be sure that you have wiped all the corners especially around corners of mouth and nose. A good rule to follow is to always press upward with your cleansing cloth or tissue. If you press upward, you naturally press out the accumulation.

1. Why do you often find black heads around the nose and corners of the mouth?

2. Which way would you think would be the better way of cleaning the face? Why?

Exercise 2. To suggest some rules for the care of the skin.

Directions: Answer the following questions:

1. How often does one need to bathe?

2. How can you keep your hands from becoming rough and red?

3. What treatment would you suggest for sun burn?

4. Make out a list of rules to follow in the care of the skin.

Problem 3. How shall we plan an anti-constipation diet?

Directions: Plan an anti-constipation diet for three days.

	1st day	2nd day	3rd day
Breakfast			
Noon			
Evening			

1. What foods especially are preventors of constipation?

2. List ways to prevent constipation.

Problem 4. What exercises shall we take for constipation?

Directions: Practice exercises which use the abdominal muscles.

a. Lie on the back with knees stretched out and raise and lower knees alternately toward the chest.
b. Sit on a low stool with hands pressed against the abdominal wall, rotate the trunk from right to left without bending the back.

1. What sports or out-door exercises would strengthen the abdominal muscles?

UNIT V. HOW THE GLANDS AND NERVOUS SYSTEM SERVE THE BODY.

Problem 1. What are the characteristics of the brain?

Equipment and Materials:
Brain of animal
Piece of meat (small)
Microscope

Exercise 1. To study the structure of the brain.

Directions: Secure the brain of an animal from the butcher shop for study. Locate the cerebrum, cerebellum, medulla oblongata. Cut the brain in halves, locate the gray matter and the white matter.

1. What are the parts of the brain?

2. Where are the functions of each part of the brain located?

3. What is the difference in appearance of gray and white matter?

Exercise 2. What is a reflex action?

Directions:
a. Sit with one leg crossed over the other. Tap your leg just below the knee cap.

1. What happened?

b. Think to yourself that you will not let your foot jerk. While thinking, hit your knee again.

1. What happened?

c. Strike toward your partner's eye without giving her any warning.

1. What happened?

1. What are the reactions called?

2. Can this reaction be controlled by the brain?

3. What are some other reactions of this nature?

Exercise 3. To examine a nerve.

Directions: Take a piece of meat and locate a nerve. Use a microscope if necessary.

1. Describe a nerve.

2. What is a dendrite?

3. Why is it necessary to have so many dendrites?

4. Where are nerves found?

5. How do nerves govern our body?

Problem 2. How can we test the senses?

Equipment and Materials:

Hairpin (1)
Compass (1)
Ruler (1)
Salt (few grains)
Sugar (few grains)
Vinegar (few drops)
Quinine (few grains)
Chart for astigmatism
Watch

Exercise 1. To test for heat and cold spots.

Directions:

a. Heat a hairpin until warm and move it lightly over the skin of your arm.

1. Did you find any spots that were sensitive to heat?

b. Cool the hairpin by placing it on a piece of ice. Move it over the skin of your arm.

1. Did you find any spots that were sensitive to cold?

Exercise 2. To test parts of the body sensitive to touch.

Directions: Using a compass, have your partner touch the back of your hand with the two points. Have the points together at the beginning, gradually separating them until you can feel two distinct points. Measure the distance between the two points. Try other parts of your body and record results.

1. Places touched:

Back of hand_____
Palm of hand_____
Back of neck_____
Fingertips _____
Cheek _____

2. What parts of your body are most sensitive to touch?

Exercise 3. To test the sense of taste.

Materials: salt, sugar, vinegar, quinine

Directions:

a. Hold some warm water in the mouth for a short time. Put a little sugar on the tip of the tongue. Repeat

first holding a piece of ice in your mouth for a short time. Put a little sugar on the tip of your tongue.

1. What differences did you notice?

2. Where would this information be of value to us?

b. Put each of the following -- salt, sugar, vinegar, and quinine on the tip of the tongue, sides and back.

1. Where did you taste the following:

Salt _____
Sugar _____
Vinegar _____
Quinine _____

Exercise 4. To study sense of sight.

Directions:

a. Secure a chart for astigmatism or use the one in your text. Place the chart 20 feet away. Look at the lines. Do all lines appear the same?

1. What is astigmatism?

2. What causes astigmatism?

3. What is the treatment for astigmatism?

b. Secure a Snellen test chart. Place 20 feet away. Hold hand over one eye and read letters. If the letters can be read correctly the eye is normal. Test other eye.

1. What do we mean when we say a person is far-sighted?

2. When we say a person is near-sighted?

Exercise 5. To test for hearing.

Directions: Blindfold your partner. Hold a watch

near the right ear and gradually move it away from her ear. Raise your hand when you can not hear the watch. Measure from pupil to spot where the watch could no longer be heard. Record the result of each member in the class.

1. How do the hearing qualities of the members differ?

2. How would this exercise be of value in seating arrangement of the class?

Problem 3. What are the characteristics of the endocrine glands?

Equipment and Materials:
Rabbit

Exercise 1. To study some of the endocrine glands.

Directions: This would be a good demonstration lesson by the teacher.

a. Remove the muscle from the neck of a rabbit and show the thyroid gland to the class.

b. Remove the brain from the cavity and find the reddish gray body (pituitary body) at the base of the brain. Show this body to class. Likewise have them look to see if the gland was connected by means of a duct.

Exercise 2. To study ductless glands.

Directions: After this demonstration or after the study of endocrine glands, have pupils answer the following questions.

1. Locate the following endocrine glands and give the following information about each.

Gland	Location	Normal Function	Changes in over activity	Changes in under activity
1. Thyroid				
2. Para-thyroid				
3. Thymus				

4. Pituitary			
5. Adrenal			
6. Pancreas			

2. What is the secretion from an endocrine gland called?

3. What is the general function of the endocrine glands?

Problem 4. How shall we plan for the care of our nervous system?

Exercise 1. To plan the care of the nervous system.

1. What is nervousness?

2. What are some causes of nervousness?

a.
b.
c.
d.

3. How may we overcome nervousness?

4. How does alcohol affect the nervous system?

5. What are stimulants?

6. What are narcotics?

7. How do stimulants and narcotics affect the nervous system?

8. List some rules or habits to follow that will keep the nervous system healthy.

UNIT VI. PROTECTING OURSELVES AND OTHERS FROM DISEASE AND INJURY.

Problem 1. How shall we make a chart of common diseases?

Exercise 1. To study characteristics and treatment for common diseases.

Directions: Look up information in regard to the common diseases and fill in chart.

Disease	Means of Communication	Incubation period and early symptoms.

Problem 2. What are the characteristics of disease producing microorganisms?

Equipment and Materials:

Beef extract (1 cube)	Penny
Gelatin (1 envelope)	Hair
Jar lids (5)	Any small object
Pencil stub	

Exercise 1. To study the spread of disease by contact.

Directions: Make some plates by sterilizing some lids of jars or use petri dishes. Prepare culture by mixing a little beef extract with gelatin. In the dishes place a stub of a pencil, coin, hair, dust, and other small articles. Keep plates where warm and examine daily.

1. What did you observe?

Material	2nd day	3rd day	4th day	6th day
1.				
2.				
3.				
4.				
5.				

2. Name the ways of spreading disease by contact.

3. What does this teach us about our every day habits?

4. What are the characteristics of a disease producing microorganisms?

Problem 3. How can we protect ourselves from disease?

A. There is an epidemic of influenza in the community. Plan the procedure you would follow to keep from having the disease.

1.
2.
3.
4.
5.

B. Plan the procedure you would follow to build up resistance against any disease.

1.
2.
3.
4.
5.

Problem 4. How can we prevent injury to ourselves and others?

A. Find an article in some magazine or newspaper about "Safety First". Report on it to the class.

1. What organizations are aiding with a "Safety First" program?

2. How many persons are injured yearly in United States in some kind of an accident?

3. What can you do to help prevent accidents?

UNIT VII. OUR PART IN HEALTH PROGRAM.

Problem 1. What are the quarantine laws of our state and city?

Directions: Write to the State Board of Health and secure the quarantine laws of our state. Find out from health officer your city quarantine laws.

1. Why is quarantine necessary?

2. What diseases are quarantined?

3. Why are quarantine laws necessary?

4. What are the quarantine laws in Kansas?

5. Are quarantine laws the same for all states? Cite examples.

6. What is our responsibility to the quarantine laws?

Problem 2. How shall we judge the community's health?

Directions: Study your community. Find out the following information:

Population of city	No. medical doctors	No. dentists	Epidemic	No. cases in past 12 months

1. What are the sanitary regulations of your community?

2. Would you consider your community a healthy one? Why?

Problem 3. How shall we determine the cost of ill health?

Directions: Take a specific disease as scarlet fever or an operation for appendicitis and calculate the cost of

a. Doctor's fees
b. Medicine
c. Hospital or nursing
d. Loss of time from school or work

Make a graph to show the cost of the illness.

1. What are some after effects of diseases?

2. How would they affect the cost?

UNIT VIII. HOW THE REPRODUCTIVE SYSTEM IS RELATED TO OUR HEALTH.

Problem 1. How shall we care for ourselves at the menstrual period?

Directions: Read the pamphlet "The Periodic Cycle" by the Modess Corporation, or the following:
"Being Born", by Frances Strain
"Growing Up in the World Today", by Clapp

1. What are some suggestions for proper physical care during menstruation?

2. What should be avoided during the menstrual period?

3. What often causes menstrual disturbances?

4. Why should one see the doctor if there is any abnormalities of menstruation?

5. What is the danger of "quack" remedies in menstruation?

Problem 2. What are the characteristics of a developing embryo?

Directions:

a. Locate the embryo in a bean seed. Plant a few seeds in sawdust, water, and keep in sunlight. Examine every few days.

b. If possible put some eggs in an incubator. Examine one at the end of 24 hours, 48 hours, and 72 hours.

1. What inside forces are necessary for the growth of an embryo?

2. What outside forces are necessary for the growth of an embryo?

3. What must take place before an embryo can be formed?

UNIT IX. EVALUATING HEALTH INFORMATION.

Problem 1. What protection should we have from a food and drug act?

Directions: Write to the United States Department of Agriculture for a copy of the national food and drug act. Also a copy of the state food and drug law from the Board of Health. Read.

1. What protection does our food and drug act give us?

2. What do you think the food and drug law should contain?

3. How are these laws made?

4. Why is it difficult to secure adequate food and drug laws?

5. What should be our attitude toward the present food and drug act?

6. What should be our attitude toward the securing of a better food and drug act?

Problem 2. How shall we evaluate advertisements pertaining to health?

Directions: Find several advertisements in magazines and newspapers of foods, drugs, cosmetics. Study carefully. Analyze and point out any statements that might be false or misleading. Mount a few of those advertisements for future use.

1. What kind of information did you find in the advertisements?

2. What dangers might result from advertisements?

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